An Empirical Investigation

of Inward Foreign Direct Investment

in Vietnam

A thesis

submitted in partial fulfilment

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Linh Tu Ho

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Abstract of a thesis submitted in partial fulfilment of the
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Abstract

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This study investigates inward Foreign Direct Investment (FDI) at the national, regional and provincial levels in Vietnam. The focus is to examine the long-run bi-directional relationship between FDI and economic growth (EG), FDI competition, the effects of policies and laws on attracting FDI, and the determinants of FDI location selection. The study employs a three-step approach including Pedroni's model, ordinary least squares (OLS) estimation, and the error correction model to evaluate the long-term relationship. Retail sales of goods and services are employed instead of Gross Domestic Product (GDP) to represent EG at the regional and provincial levels, which reduces the limitations of GDP calculations at non-national levels. The OLS estimation is used to examine FDI competition, to identify the FDI determinants, especially those determinants affecting FDI location selection from the investors' perspective. The provincial competitiveness index (PCI) and sub-indices are employed to investigate PCI-based competition in FDI attraction. The investment incentive policies (IIP) index is proposed as an aggregate index of three types of investment incentives (free land, income tax exemption, and import tax exemption) to examine IIP-based competition in FDI attraction. The study investigates the effects of laws, including the release of new investment and enterprise laws in 2005, and participation in the World Trade Organisation (WTO) and Free Trade Agreements (FTA) on FDI in Vietnam. Country risk and website quality indices are proposed to identify the determinants of the FDI location selection. Ranking regions, provinces and cities based on their socio-economic conditions is employed to investigate different effects of the determinants in different areas in Vietnam.

The study has several important findings. A long-term bi-directional positive relationship between FDI and EG is found at the Vietnam provincial level. FDI plays a less important role in promoting EG at the national level. Foreign investors are more likely to invest in areas with better economic

governance (a higher PCI). Only three of nine PCI sub-indices (assistance to foreign investors to start a business, access to information, and solving legal matters) significantly affect FDI. Assisting the investors to start a business is likely to be the most important PCI sub-index. Higher investment incentives (a higher IIP index) are not attractive FDI factors. Changes to laws and the WTO and FTA memberships may not be important at national and regional levels, but significantly impact on FDI at the provincial level. Provinces with more difficult socio-economic conditions attract less FDI. The positive effects of the new laws in 2005 and infrastructure development on FDI attraction decrease in provinces with more difficult socio-economic conditions. Geographical concentration of FDI exists at the provincial level. Foreign investors tend to invest more in an area with higher EG, better educated labour force, lower value currency, more efficient capital use, lower inflation rate, better economic governance, fewer investment incentives, and better infrastructure. Interestingly, FDI flows into Vietnam increased after the 2008 financial crisis. Investors may have invested in Vietnam after the financial crisis to take advantage of a lower value currency and lower cost in areas offering high IIP.

Keywords: Foreign direct investment, economic growth, provincial competitiveness index, investment incentive policies, FDI location selection.

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Abbreviations

ACFTA	ASEAN – China Comprehensive Economic Cooperation Agreement
ADF	Augmented Dickey – Fuller
AFTA	ASEAN Free Trade Area
AJCEP	ASEAN – Japan Comprehensive Economic Partnership
AKFTA	ASEAN – Korea Comprehensive Economic Cooperation Agreement
ANZ	Australia and New Zealand
APEC	Asia Pacific Economic Cooperation
ARIC	Asia Regional Integration Center
ASEAN	Association of Southeast Asian Nations
BRICS	Brazil, Russia, India, China, and South Africa
BTA	Bilateral Trade Agreement
CD	Cross-sectional Dependence
CECA	Comprehensive Economic Cooperation Agreement
CEE	Central and Eastern European
CH	Central Highlands
CPI	Consumer Price Index
CR	Country Risk
DF	Dickey – Fuller
DF-GLS	Dickey-Fuller Generalized Least Squares
DOLS	Dynamic Ordinary Least Squares
ECM	Error Correction Model
ECT	Error Correction Term
EG	Economic Growth
EPA	Economic Partnership Agreement
ER	Exchange Rate
ERS	Elliot-Rothenberg-Stock
EU	European Union
FDI	Foreign Direct Investment
FIEs	Foreign Investment Enterprises
FMOLS	Fully Modified Ordinary Least Squares
FTA	Free Trade Agreement
GDP	Gross Domestic Product
GLS	Generalised Least Squares
GMM	Generalised Method of Moments
GNI	Gross National Income
GSO	General Statistics Office
ICOR	Incremental Capital Output Ratio
ICRG	International Country Risk Guide
IIP	Investment Incentive Policies
IPS	Im, Pesaran and Shin
KPSS	Kwiatkowski-Phillips-Schmidt-Shin
LF	Labour Force
LLC	Levin, Lin and Chu
LM	Lagrange Multiplier
LSDV	Least Square Dummy Variable
MENA	Middle East and North Africa
MIC	Ministry of Information and Communications
MOIT	Ministry of Industry and Trade
MOLISA	Ministry of Labor, Invalids and Social Affairs
MOST	Ministry of Science and Technology
MOT	Ministry of Transport

MPI	Ministry of Planning and Investment
MRD	Mekong River Delta
NCCCA	North Central and Central Coastal Areas
NCSCC	North Central and South Central Coast
NMMA	Northern Midlands and Mountain Areas
NP	Ng and Perron
OECD	Organisation for Economic Co-operation and Development
OLS	Ordinary Least Squares
OT	Open Trade
PCI	Provincial Competitiveness Index
PECM	Panel Error Correction Model
POP	Population
PP	Phillips-Perron
PR	Province Ranking
PRD	Pearl River Delta
PRS	Political Risk Services
PSD	Private Sector Development
R&D	Research and Development
RR	Region Ranking
RRD	Red River Delta
RS	Retail Sales
SE	South East
SOLS	Static Ordinary Least Squares
TPP	Trans Pacific Partnership
UNCTAD	United Nations Conference on Trade and Development
US	United States
USD	United States Dollar
VAR	Vector Autoregression
VCCI	Vietnam Chamber of Commerce and Industry
VEC	Vector Error Correction
VECM	Vector Error Correction Model
VND	Vietnam Dong
VOEA	Vietnam Open Educational Resources
WB	World Bank
WEB	Website Quality
WTO	World Trade Organisation
YRD	Yangtze River Delta

Chapter 1

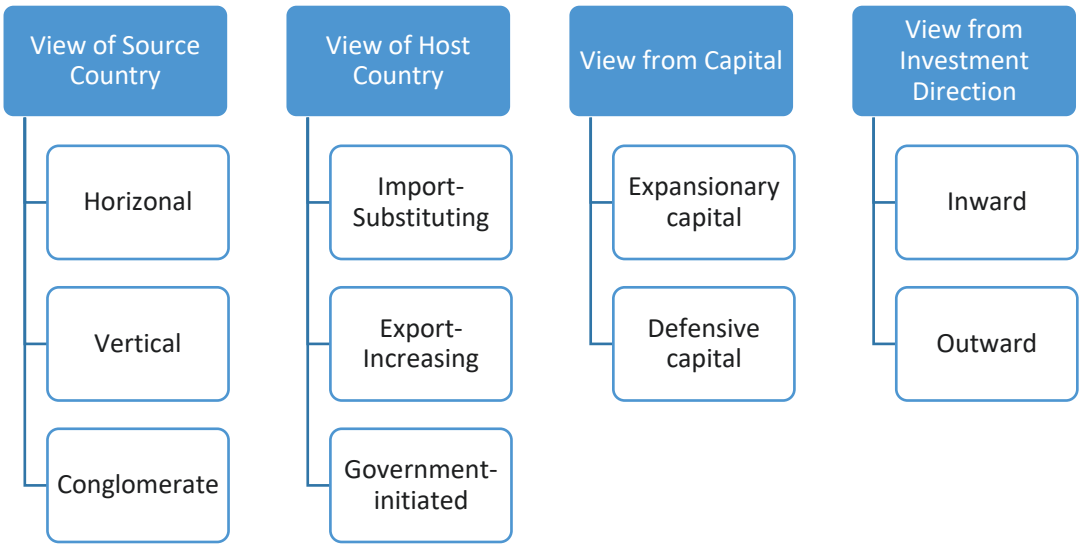
Introduction

1.1 Background

Definitions of Foreign Direct Investment (FDI) have changed over time. In 1999, the Organisation for Economic Co-Operation and Development (OECD) defines FDI as "the objective of obtaining a lasting interest by a resident entity in one economy in an entity resident in an economy other than that of the investor" (OECD, 1996, p. 7). Thirteen years later, OECD (2009, p. 17) redefines FDI as "a category of cross-border investment made by a resident in one economy (the direct investor) with the objective of establishing a lasting interest in an enterprise (the direct investment enterprise) that is resident in an economy other than that of the direct investor. The motivation of the direct investor is a strategic long term relationship with the direct investment enterprise to ensure a significant degree of influence by the direct investor in the management of the direct investment enterprise". Kumari (2014, p. 118) adds that "FDI refers to an investment in a foreign country where the investor retains control over the investment".

Pazienza (2014) summarises three different ways to classify FDI. From the view of the investor or the source country, FDI can be classified as horizontal, vertical and conglomerate. FDI can also be categorized into import-substituting, export-increasing and government-initiated FDI from the view of the host country. The last classification divides FDI into two categories, expansionary and defensive capital. Pazienza (2014) emphasises the importance of understanding inward and outward FDI flows or stocks based on the directions of investment in the home country or abroad, respectively. Therefore, FDI can be understood in four different ways (see Figure 1.1).

FDI can be measured quantitatively both as a flow and stock for associates and subsidiaries, and for branches (Pazienza, 2014). For associates and subsidiaries, FDI flows consist of the net sales of shares and loans to the parent company, plus the effects of parent firm's share of the affiliate's reinvested earnings plus total net intra-company loans (short term and long term) provided by the parent company. On one hand, FDI stocks represent the value of the share of the capital and reserves attributable to the parent enterprise, plus the net indebtedness of the associate or subsidiary to the parent firm (UNCTAD, 2018). For branches, though FDI flows consist of the increase in reinvested earnings plus the net increase in funds received from the foreign direct investor, FDI stocks include the value of fixed and current assets and investments, excluding amounts due from the parent, less liabilities to third parties.



Source: Pazienza (2014)

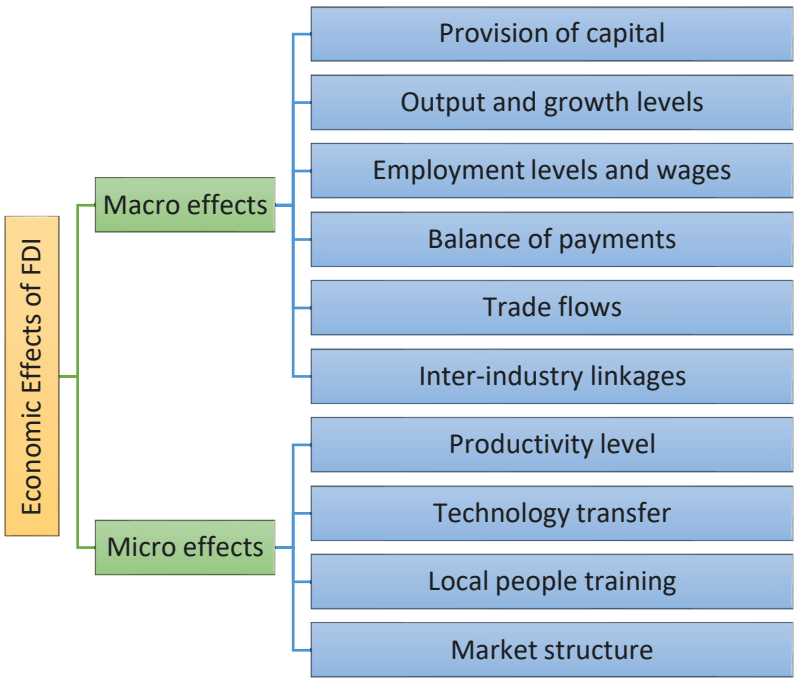
Figure 1.1 The Different Classifications of FDI

In general, FDI effects involve the transfer of various elements from an investing country to a host country (Pazienza, 2014); these elements can be economic, political, social and natural environmental effects. Figure 1.2 illustrates the economic elements including macro effects (the provision of capital, output and growth levels, employment levels and wages, balance of payments, trade flows, and host economy via inter-industry linkages) and micro effects (productivity level, technology transfer, local people training, and market structure).

The relationship between FDI and economic growth (EG)[1] has been studied in various countries by many researchers. However, not many studies investigate the bi-directional relationship between FDI and EG. Kinuthia and Murshed (2015), Omri and Kahouli (2014), Moudatsou and Kyrkilis (2011), Andraz and Rodrigues (2010) and Srinivasan, Kalaivani, and Ibrahim (2010) find a two-way causal link between them. Except for Andraz and Rodrigues (2010) and Srinivasan et al. (2010), most researchers did not study the long-term relationship.

FDI determinants have been studied broadly by many researchers. They found that, besides EG, many other factors have been considered key drivers that can boost or impede the flow of FDI. Though some factors, such as trade openness, stable inflation, infrastructure development, exchange rate, market size and domestic investment, have played a positive role in the FDI flow (Kinuthia & Murshed, 2015; Labes, 2015; Castiglione, Gorbunova, Infante, & Smirnova, 2012), others, such as higher unemployment, existence of poverty, excessive population, higher level of risk and corruption, have an adverse effect (Kumari, 2014).

[1] EG is defined as an increase in the Gross Domestic Product of a country over a specific period (NZIER, 2018; Haller, 2012).



Source: Pazienza (2014)

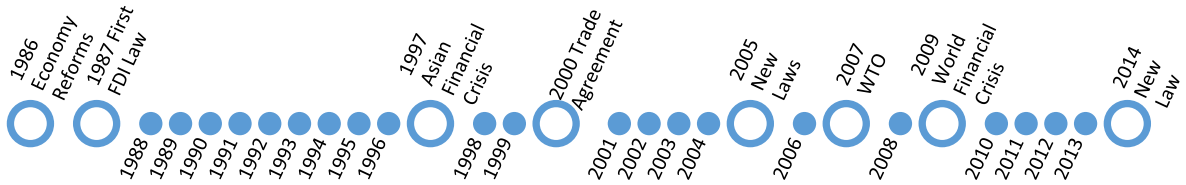
Figure 1.2 The Economic Effects of FDI

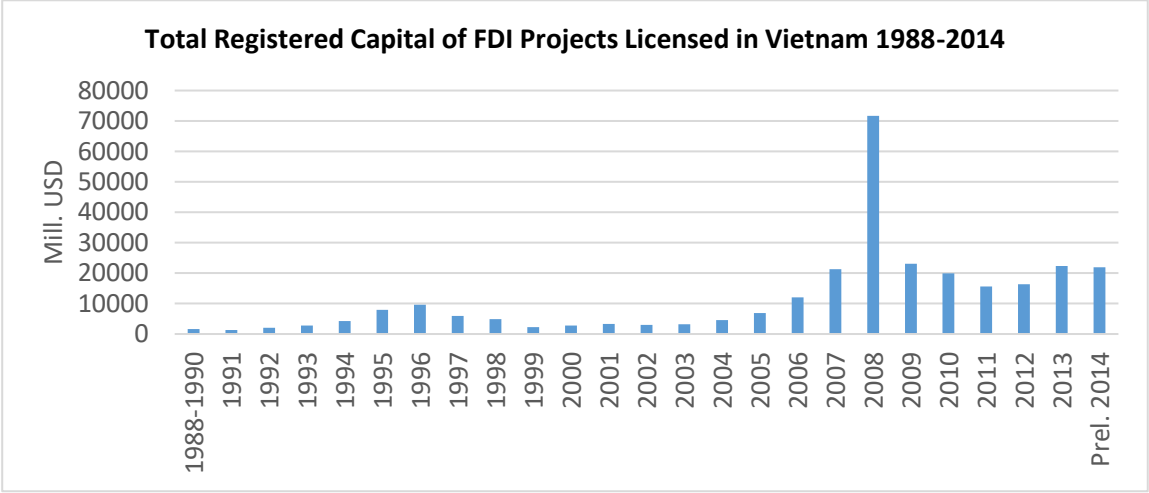
In addition, some researchers have conducted studies on the determinants of investors' decisions about where to locate capital. Important factors identified include improved democracy (Hasan & Mahvash, 2015), higher education levels and lower delinquency rates (Escobar, 2013), and political stability and security (Castiglione et al., 2012).

However, there are still debatable conclusions about some FDI determinants such as trade openness, exchange rate, and inflation. Though Razmi and Behname (2012) find that trade openness exhibits a negative impact on FDI, but it positively affects FDI according to studies by Hasan and Mahvash (2015), Kinuthia and Murshed (2015), and Labes (2015). Similarly, the exchange rate impacts FDI in both a positive (Kinuthia & Murshed, 2015; Labes, 2015) and negative direction (Kinuthia & Murshed, 2015; Haq, 2001). Hasan and Mahvash (2015) and Razmi and Behname (2012) show that the inflation rate and FDI exhibit a negative relationship, but it is positive in Kinuthia and Murshed's (2015) study.

Vietnam has been quite successful in attracting FDI inflows since the inception of economic reform in 1986 (Nguyen & Nguyen, 2007). Figure 1.3 shows the total registered capital of FDI projects licensed in Vietnam by year from 1988 to 2014. Following the Doi Moi reform in 1986 towards a market economy, Vietnam passed a law on 29 December, 1987, that gave the first legal basis for FDI (Hoang & Goujon, 2014). Licensed FDI in Vietnam rose rapidly from 0.3 billion United States Dollars (USD) in 1988 to 10 billion USD in 1996. After a fall resulting from the Asian financial crisis in 1997 (FDI reached only 2.8 billion USD in 2000), FDI recovered to high levels in the 2000s, supported by the trade agreement with the United States (US) in 2000. With significant reforms of the business and

investment law in 2005 and accession to the WTO in 2007, FDI grew significantly to 21 billion USD in 2007 and 71 billion USD in 2008. The 2008 world financial crisis affected Vietnam's FDI, which fell to 20 billion USD in 2010. That level decreased to 15.6 billion USD in 2011 before it recovered and varied around 22 billion USD in 2013 and 2014. According to Hoang and Goujon (2014), Vietnam benefited from FDI in terms of its contribution to EG, foreign currency flows, and production systems. However, the FDI distribution was unequal, and this led to inequality of development and income among the provinces and cities in Vietnam (Hoang and Goujon, 2014).





Note: Prel. stands for Preliminary.

Source: Data collected from GSO (2016h)

Figure 1.3 Total Registered Capital of FDI Projects Licensed in Vietnam 1988-2014

In general, empirical studies of inward FDI in Vietnam have focused on topics that can be divided into five main groups: (i) the relationship between FDI and EG (Nguyen & Ho, 2013; Nguyen, Ho, & Zhang, 2012; Hoang, Wiboonchutikula, & Tubtimtong, 2010; Srinivasan et al., 2010); (ii) FDI provincial competition (Nguyen & Ho, 2013; Nguyen, Ho, et al., 2012; Malesky, 2010; Nguyen & Nguyen, 2007); (iii) policies' effects on FDI (Hoang & Goujon, 2014; Vu, Ngo, & Ho, 2009); (iv) laws' effects on FDI (Nguyen & Ho, 2013; Nguyen, Ho, et al., 2012; Pham, 2011); and (v) FDI location and industry selection (Hoang & Goujon, 2014; Vu et al., 2009; Nguyen & Nguyen, 2007). However, no single study explores all five topics.

Many researchers have studied the effects of FDI on Vietnamese EG or Gross Domestic Product (GDP). The bi-directional link between them was investigated recently by Srinivasan et al. (2010).

They employed the Johansen Cointegration technique followed by the Vector Error Correction Model (VECM) and standard Granger Causality test to investigate the causal nexus between FDI and EG in ASEAN economies. Though the Johansen Cointegration result showed a long-run relationship between FDI and GDP in Indonesia, Malaysia, the Philippines, Singapore and Vietnam, the empirical results of VECM revealed a long-run bi-directional causal link between GDP and FDI for only Malaysia and Vietnam. This gives rise to questions whether this link is strong and to what extent GDP affects FDI as well as how much FDI can explain GDP growth in Vietnam.

To attract FDI, the Vietnamese government uses Investment Incentive Policies (IIP), such as subsidies to affect the investment location. Forms of investment incentives include tax preferences, grants, tax holidays, free of land use and other inputs (Thomas, 2009), and regulatory policy concessions (Oman, 2000). Mayer and Nguyen (2005) emphasise that foreign investors make decisions on their operations' locations based on institutional conditions that are different not only among countries but also within a host country.

The Vietnam Ministry of Finance reports that 32 of 48 surveyed provinces issued extra-legal documents granting extra incentives to investment projects (Vu, Le, & Vo, 2007). Vu et al. (2009) show 11 of the 32 provinces in Vietnam had violated the regulations of corporate income tax, and 21 provinces offered more land incentives than the national land framework with an extension of the exemption period up to 20 years.

Vu (2007) reveals that provinces that adopted extra-legal incentives experienced a decrease in the amount of FDI per capita after the adoption of extra-legal incentives. However, this conclusion was based on only a small survey of foreign firms in 2008. According to Vu et al. (2009), Vietnam made great efforts to regulate sub-national incentives. Hence, the issue of whether investment incentives actually reduce or raise the amount of FDI is questionable.

The effects of laws and agreements on FDI may be another critical issue. Because Vietnam's commitments under the WTO and the FTAs with the US and other countries require national treatment after phase-in periods, the needs of foreign and domestic investors with regard to regulatory policies should be converging. Consequently, a significantly positive impact on inward FDI was reported after Vietnam accessed the WTO (Pham, 2011). The Unified Enterprise Law (2005), Common Investment Law (2005), and the equality in income taxes between foreign and domestic firms are some of the milestones to ensure these commitments into Vietnam laws (Malesky, 2010). In Vietnam, the Investment Law (2014) was released and enacted on 1 July, 2015. Hence, it would be interesting to empirically test the effects of the laws on FDI in Vietnam.

Investors' subjective decisions in choosing the investment location are important to Vietnam's EG and development. However, only a few researchers (Hoang & Goujon, 2014; Vu et al., 2009; Nguyen & Nguyen, 2007) focus on this topic for Vietnam and their results are inconsistent. Thus, a study of the determinants of FDI location selection can provide a more comprehensive picture of what affects FDI capital location in Vietnam.

1.2 Research Problem and Objectives

There are still some outstanding issues related to FDI that have not been addressed in previous studies. These gaps are:

(i) The relationship between FDI and EG: many studies focus on the two-way nexus between FDI and EG but most researchers did not study their long-term relationship.
(ii) FDI determinants: there are still inconsistent conclusions about some FDI determinants (trade openness, exchange rate, and inflation).
(iii) Determinants of investors' decisions about where to locate their capital: it is relatively a new approach to identify the FDI determinants in terms of the investors' views in selecting investment locations because of the limited number of studies. Hence, factors such as improved democracy (Hasan & Mahvash, 2015), higher education levels and lower delinquency rates (Escobar, 2013) and political stability and security (Castiglione et al., 2012) should be further explored.
(iv) Research topics are not unified: generally, the empirical studies of FDI determinants in Vietnam have focused on five different topics, the relationship between FDI and EG; FDI provincial competition; policy effects on FDI; law effects on FDI; and FDI location selection. However, these research topics were investigated separately. This study explores these five topics in a single study to provide cohesive conclusions about FDI in Vietnam.
(v) Differences in research areas and time duration on the same topic: though some empirical studies (in Vietnam, for example) are based at the national level, others investigate at the regional or provincial level, which can generate inconsistent results. In addition, data collected during different time periods can produce different findings.

Therefore, to fill these literature gaps, I investigate inward FDI in Vietnam using a unique data set at the national, regional, and provincial levels to:

(i) Examine the bi-directional relationship between FDI and EG; and
(ii) Analyse the FDI determinants to identify the determinants affecting FDI location selection in terms of the investors' view.

The aim of this study is to investigate FDI with regard to GDP, laws, and the location of investments in Vietnam between 2000 and 2015.

The specific objectives of this study are to:

(i) identify the relationship between FDI and GDP in 63 provinces and cities of Vietnam;
(ii) examine the levels of the "Provincial Competitiveness Index (PCI)-based" competition and "IIP-based" competition in 63 provinces and cities of Vietnam in attracting FDI;
(iii) evaluate the impacts of WTO, FTAs and Vietnamese law on attracting FDI to the 63 provinces and cities of Vietnam; and
(iv) investigate factors affecting foreign investors' decisions in choosing locations to invest in Vietnam.

The research questions are:

1. What is the relationship between FDI and EG in the provinces and cities of Vietnam?
2. How does PCI-based and IIP-based competition affect FDI at the provincial level in Vietnam?
3. Does the rule of law matter in attracting FDI to Vietnam?
4. Is there any geographical concentration of FDI in Vietnam?

1.3 Research Methodology and Data

The empirical models are based on the literature and are estimated using Eview9 software.

For the first research question, Pedroni's Model is used to evaluate the long-term relationship between FDI and GDP and the relationship is re-evaluated using the Ordinary Least Squares (OLS) estimator. Next, the Error Correction Model (ECM) is employed to evaluate not only the long-term relationship but also the existence and the direction of causality between FDI and GDP. This procedure is called ***a Cointegration – OLS – ECM approach*** or ***a three-step approach*** that has not been used widely to test similar FDI links that typically use the conventional OLS estimator. ***An OLS approach*** or ***a one-step approach*** of the OLS estimator is used to examine the second, third and fourth research questions.

A panel data set will be used in this study. The study considers 63 provinces and cities in Vietnam from 2000 to 2015. For the five variables, namely, FDI, GDP, open trade (OT), exchange rate (ER), and population (POP), the study period is from 1990 to 2015 to evaluate the long-term relationship between FDI and GDP at the national level in Vietnam. The data sources include the General Statistics Office (GSO), Ministry of Planning and Investment (MPI), Ministry of Industry and Trade (MOIT), Ministry of Labor, Invalids and Social Affairs (MOLISA), Ministry of Transport (MOT), Ministry

of Information and Communications (MIC), Ministry of Science and Technology (MOST), the Vietnam Chamber of Commerce and Industry (VCCI), and the Political Risk Services (PRS) Group.

1.4 Research Contribution

FDI plays an important role in most countries in terms of developing their economy based on technological advancements, exports, production improvements and improving manufacturing employment (Naveed & Hurmat, 2013). According to Dutta (2012), these facilities bring great benefits to small and medium-sized enterprises. Therefore, this study is beneficial to various interest groups such as researchers, policymakers, foreign investors and the community.

This study attempts to extend the literature in examining the debatable issues of: (i) the relationship between FDI and GDP; and (ii) the competition, determinants, and impacts of laws or rules on attracting FDI. In addition, the study could enhance FDI into Vietnam such as: (i) offering a good reference for the Vietnamese government to understand the bi-directional relationship between FDI and GDP; (ii) identifying the factors affecting the competition to attract FDI; (iii) understanding decisions related to FDI issues that should be considered by each province or city to attract FDI in the future; and (iv) offering suggestions to the Vietnamese government and authorities to plan development projects as well as to enact laws to boost EG.

1.5 Thesis Outline

The remainder of this thesis is organised as follows: Chapter 2 provides an overview of FDI in Vietnam. Chapter 3 presents the literature on the long-term relationship between FDI and GDP as well as the determinants of FDI from both international and Vietnamese evidence. The chapter also reviews updated theories of FDI according to the five content groups: the relationship between FDI and EG, FDI provincial competition, policy effects on FDI, law effects on FDI, and investment location selection. Chapter 4 presents the data and research methodology used in the study. Chapter 5 presents the empirical findings of the study. Chapter 6 concludes the study with the key research findings and implications as well as the limitations of the study and potential future study areas.

Chapter 2

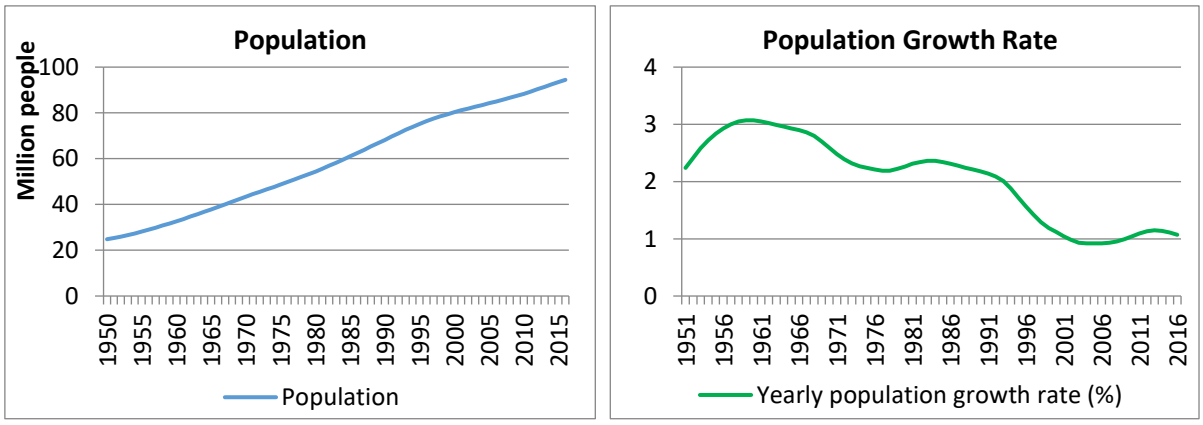
An Overview of Inward FDI in Vietnam

2.1 Introduction

This chapter provides an overview of Vietnam's socio-economic development and the attraction of FDI. Section 2.2 introduces socio-economic development in Vietnam, which includes the characteristics of the population, labour, investment and EG. Section 2.3 gives a brief introduction to the important laws and regulations related to FDI and continues with the attraction of FDI to Vietnam, which includes the number of projects, the total registered capital and the total implemented capital by years, by kinds of economic activity, by main investment counterparts (main foreign investors of Vietnam by countries), by sub-nations and the FDI contributions to the economy. Section 2.4 concludes the chapter.

2.2 Socio-economic Development in Vietnam

According to the latest UN estimate in 22 September, 2016, the population of Vietnam was 94,667,081, which was equivalent to 1.27% of the world's population and ranked 14th in the list of countries by population (Worldometers, 2016). The population density in the largest population country (China) was only 147 people per km^2, but the figure for Vietnam was over double that at 305 people per km^2. Vietnam's annual population growth rate reached a peak of 3.07% in 1960 before declining gradually and has fluctuated around 1.10% from 2011 to 2016 (see Figure 2.1).



Note: Additional information on Vietnam's population and yearly population growth rate is provided in Appendix Table A.1.
Source: Worldometers (2016)

Figure 2.1 The Total Population and Yearly Population Growth Rate of Vietnam 1950-2016

In 2015, Vietnam's labour force of 15 years of age and above was about 54 million people (around 59% of the total population). Although the labour force of Vietnam increased 1.4 times compared

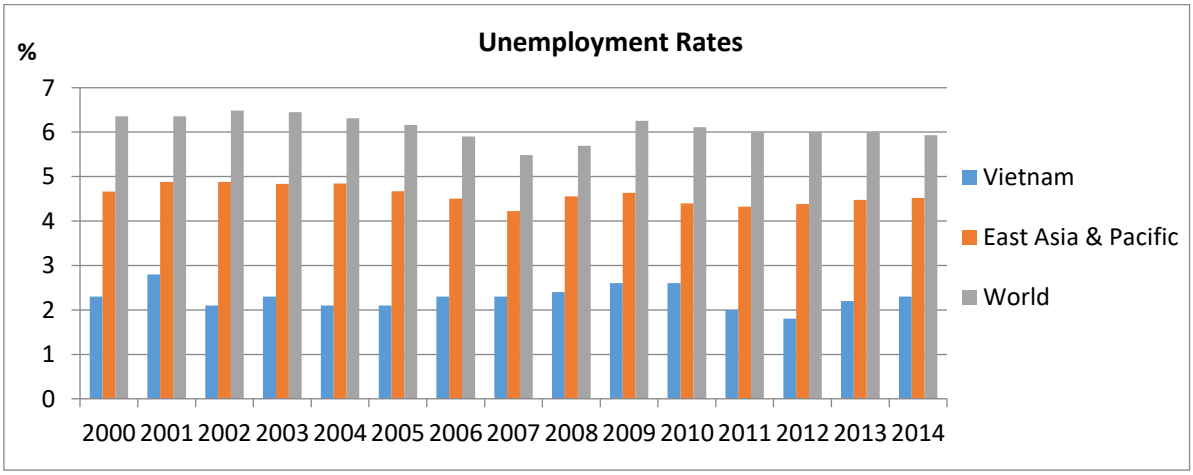
with 2000, the labour force growth rate remained constant at about 1% per year from 2000 to 2015 (see Table 2.1).

Table 2.1 The Average Population and Labour Force of 15 Years of Age and Above in Vietnam 2000-2015

Year	Average population	Labour force		
	Thousand people	Thousand people	% over average population	Labour force growth rate (%)
2000	77630.9	38545.4	49.65	-
2001	78620.5	39615.8	50.39	1.03
2002	79537.7	40716.0	51.19	1.03
2003	80467.4	41846.7	52.00	1.03
2004	81436.4	43008.9	52.81	1.03
2005	82392.1	44904.5	54.50	1.04
2006	83311.2	46238.7	55.50	1.03
2007	84218.5	47160.3	56.00	1.02
2008	85118.7	48209.6	56.64	1.02
2009	86025.0	49322.0	57.33	1.02
2010	86947.4	50392.9	57.96	1.02
2011	87860.4	51398.4	58.50	1.02
2012	88809.3	52348.0	58.94	1.02
2013	89759.5	53245.6	59.32	1.02
2014	90728.9	53748.0	59.24	1.01
2015	91713.3	53984.2	58.86	1.00

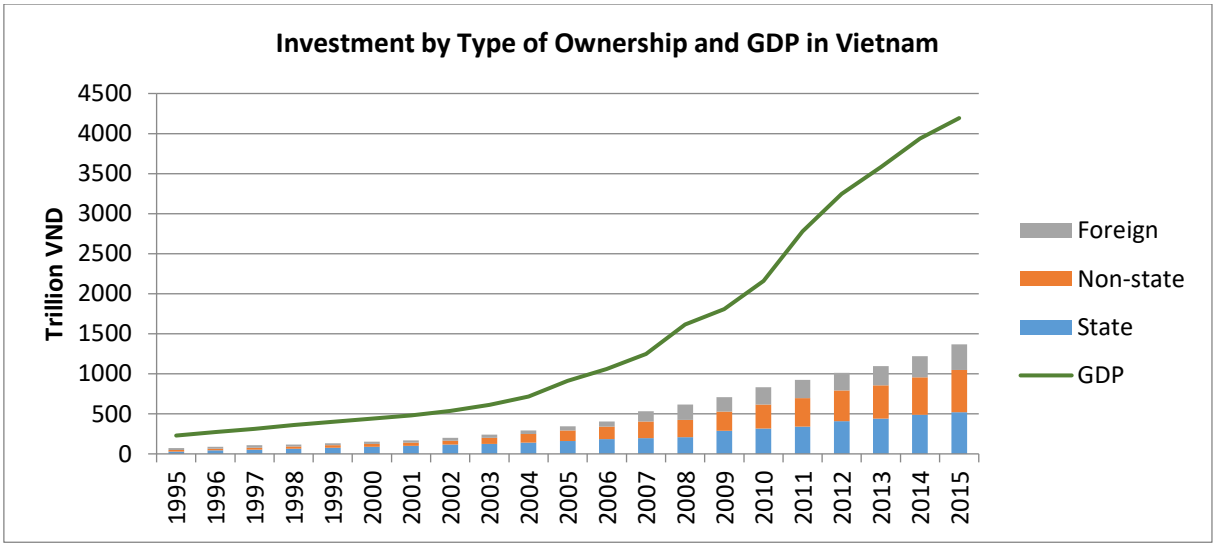
Source: Data collected from GSO (2016e), GSO (2016l) and computed by the author.

In general, from 2000 to 2014, Vietnam's unemployment rate was only a half of that of the East Asia and Pacific region and much lower than the world unemployment rate. It had two peaks, 2.8% and 2.6% in 2001 and 2010, respectively, before dropping to 1.8% in 2012, and rose to 2.3% in 2014 (see Figure 2.2). Appendix Table A.2 provides the unemployment rates for Vietnam, the East Asia and Pacific region, and the world from 2000 to 2015.



Source: Data collected from the WB (2016c).

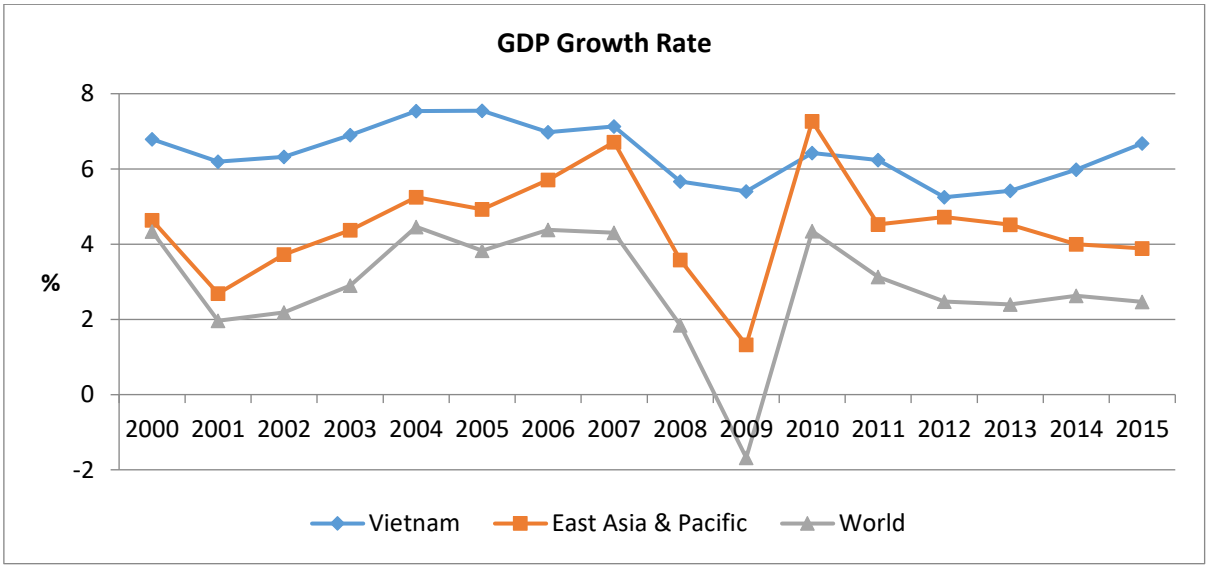
Figure 2.2 The Unemployment Rates in Vietnam, East Asia and the Pacific and the World 2000-2014



Note: Additional information on investment by type of ownership and GDP is provided in Appendix Table A.3.
Source: Data collected from GSO (2016i) and GSO (2016j).

Figure 2.3 Investment by Type of Ownership and GDP in Vietnam 1995-2015

Figure 2.3 illustrates the total capital investment at current prices by type of ownership and GDP at current prices in Vietnam between 1995 and 2015. The total capital has grown rapidly from 70 trillion Vietnam Dong (VND) to nearly 1,370 trillion VND over the 21 years. Generally, there was an increase in the capital of all three ownership types: state-owned sector, non-state-owned sector and foreign invested sector[2]. Based on the data from GSO (2016j), the state sector contributed most in terms of



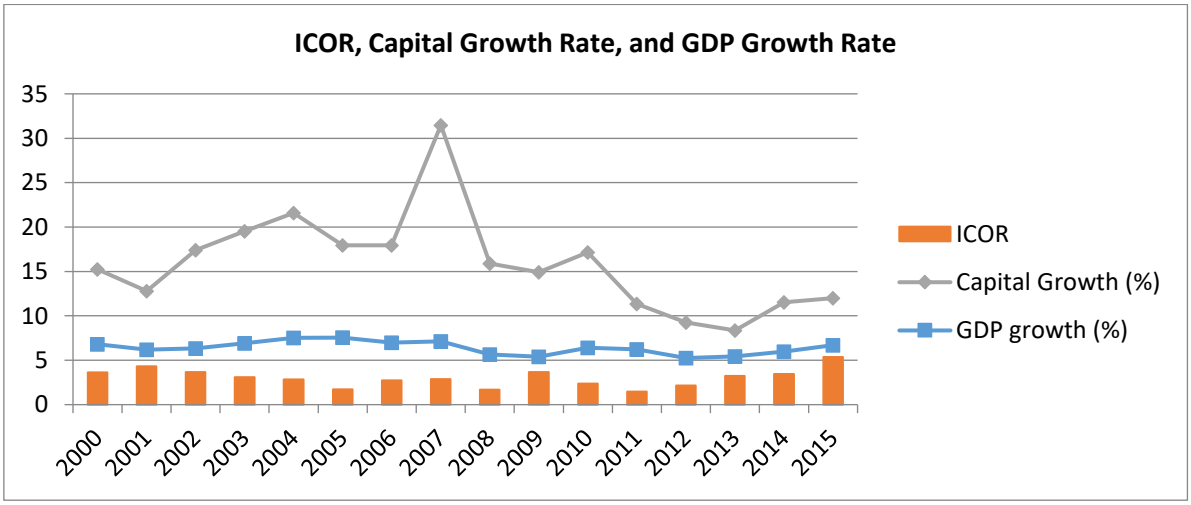
Note: Additional information on GDP growth rate of Vietnam, the East Asia and Pacific region, and the world is provided in Appendix Table A.4.
Source: Data collected from the WB (2016c).

Figure 2.4 The GDP Growth Rate of Vietnam, East Asia and the Pacific, and the World 2000-2015

[2] The investment sector includes foreign capital.

total capital each year until 2014, followed by the non-state sector and the foreign invested sector. In 2015, the percentage of non-state sector capital (38.7%) was higher than that of the state sector (38%).

In addition, although Vietnam GDP grew remarkably from 900 trillion VND in 2005 to over 4,100 trillion VND in 2015 (see Figure 2.3), the EG rate increased slowly (GSO, 2016f). As shown in Figure 2.4, the Vietnam economy experienced quite a high and stable GDP growth rate compared with EG rates in the East Asia and Pacific region and the world. Between 2008 and 2009, while the rates of the East Asia and Pacific region and the world declined dramatically from 3.58% to 1.32% and from 1.84% to -1.68% respectively, Vietnam still maintained a GDP growth rate of about 5.5% that has risen gradually to 6.7% by 2015.



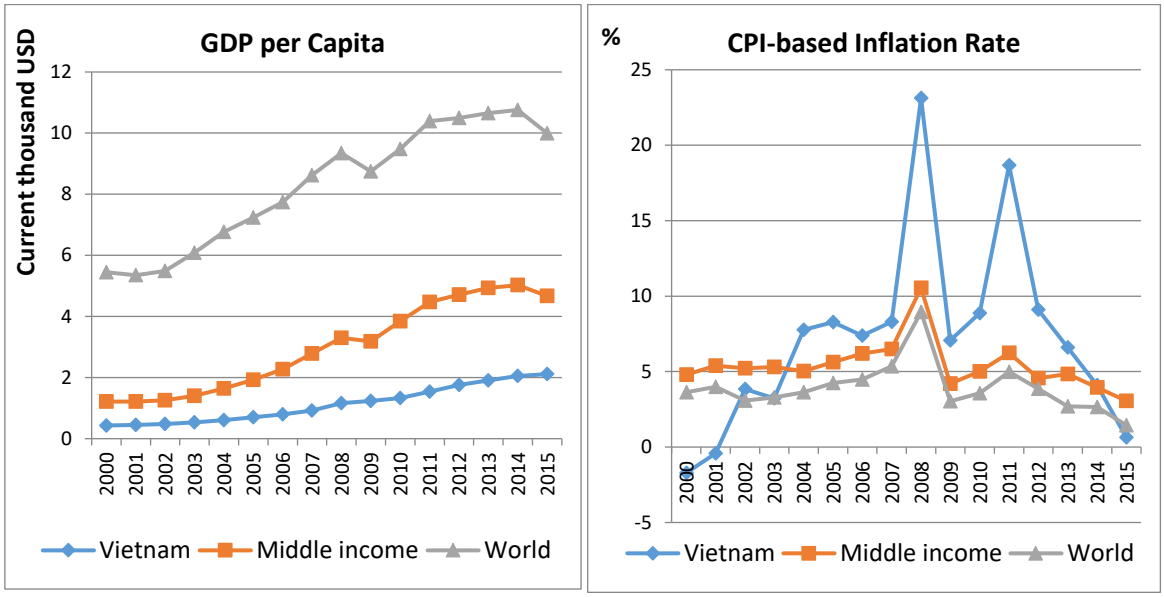
Note: Additional information on the GDP growth rate, capital growth rate, and ICOR of Vietnam is provided in Appendix Table A.4 and Table A.5.
Source: ICOR and capital growth rate computed by the author based on data collected from GSO (2016j), GDP growth rate data collected from the WB (2016b).

Figure 2.5 The ICOR, Capital Growth Rate, and GDP Growth Rate of Vietnam 2000-2015

In terms of investment efficiency, the Incremental Capital Output Ratio (ICOR)[3] (see Figure 2.5) shows the inefficient use of the capital invested in development in Vietnam. From 2000 to 2010, although the capital growth rate exhibited large fluctuations, especially the big jump in 2007 and quick drop in 2008, the ICOR for Vietnam reached a peak of 4.3 in 2001 and kept stead at 2.8 in 2007 and 2008 before rising to 3.67 in 2009 and falling to 2.38 in 2010 (see Figure 2.5). From 2011 to 2015, the Vietnam ICOR increased quickly from 1.49 to 5.36, which means that, to create one more VND in GDP in 2015, the economy had to invest 5.36 VND, which was much higher than the 1.49 VND in 2011. This situation can be called a "hungry status in capital" but the capital is used inefficiently (GSO, 2016f). In addition, Vietnam's growth rate of capital was much higher than that of GDP

[3] ICOR is an aggregated indicator of the ratio of investment to growth, which is equal to 1 divided by the marginal product of capital.

between 2000 and 2015. On average, the capital growth rate was 15.9%, which was about 2.5 times the economy's growth rate (6.4%) over the 16 years (see Figure 2.5).

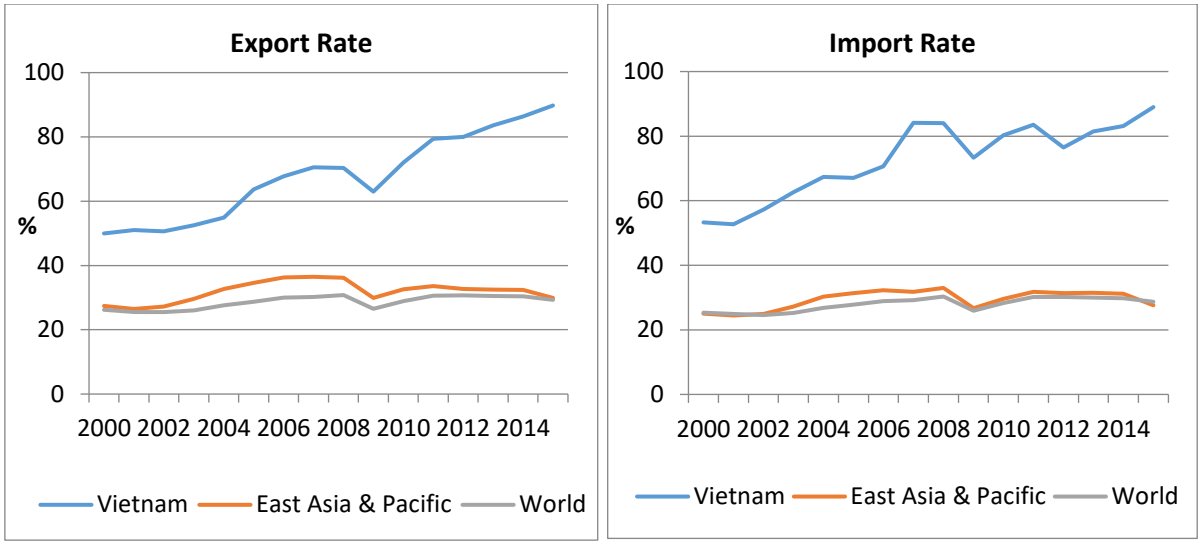


Note: Additional information on GDP per capita and CPI-based inflation rates of Vietnam, the middle-income group and the world is provided in Appendix Table A.6.
Source: Data collected from the WB (2016c).

Figure 2.6 The GDP per Capita (left) and CPI-based Inflation Rate (right) of Vietnam, the Middle Income Group Countries, and the World 2000-2015

It can be seen clearly from Figure 2.6 that Vietnam has had a lower GDP per capita but higher inflation rate than those of the middle-income group countries and the world. In terms of GDP per capita, Vietnam used to be one of the poorest countries but presently has become a lower middle-income nation with over 2000 USD per capita since 2014 (GSO, 2016f). Although Vietnam GDP per capita in 2015 reached 2,111.14 USD (4.87 times higher than that of 2000), the number equalled only around a half and a fifth of those of the middle income group countries and the world, respectively. Vietnam's inflation rate was unstable with two extreme changes in 2008 and 2011. The CPI-based inflation rate of the country dramatically jumped up from 8.3% in 2007 to 23.1% in 2008, followed by a sharp drop to 7.1% in 2009 before going up to 18.7% in 2011. From 2012 to 2015, Vietnam experienced a downward trend in its inflation rate like the middle-income group countries and the world (see Figure 2.6), but its CPI-based inflation rate decreased more quickly and was much lower in 2015 (only 0.63% compared with 3.06% and 1.44% of the middle-income group countries and the world, respectively).

Compared with East Asia and the Pacific and the world, international trade has played quite an important role in developing Vietnam's economy from 2000 to 2015, which is shown by the export and import rates over GDP in Figure 2.7. Though the figures for East Asia and the Pacific and the world were quite steady around 30% from 2000 to 2015, Vietnam's export and import proportions over GDP increased from approximately 50% in 2000 to about 90% in 2015 (see Appendix Table A.7).



Source: Data collected from WB (2016c).

Figure 2.7 The Export Rate (left) and Import Rate (right) as a Percentage of GDP in Vietnam, East Asia and the Pacific, and the World 2000-2015

In conclusion, although Vietnam has advantages (such as the high labour force rate over average population, low unemployment rate, and high and steady GDP growth rate), the country has faced difficulties in using capital efficiently, controlling the inflation rate, and administering international trade, as well as managing the economy.

2.3 Inward FDI in Vietnam

2.3.1 Regulations Related to FDI in Vietnam

Historically, since the Doi Moi reform in 1986, many laws and regulations related to FDI have been promulgated and taken in effect in Vietnam. Table 2.2 lists the important laws including the first FDI law in 1987, the Law on Foreign Investment in Vietnam in 1996, the Unified Enterprise Law in 2005, the Common Investment Law in 2005, and the new Investment Law in 2014. The first FDI law in 1987, Law No. 4-HĐNN8 dated 29 December, 1987, of the National Assembly on Foreign Investment in Vietnam, has been considered one of the most important legal documents for the country to begin attracting foreign capital sources (Hoang & Goujon, 2014). Following amendments and supplements in 1990 and 1992, this law was replaced by the Law on Foreign Investment in Vietnam 1996 dated 12 November, 1996, which was modified in 2000 by the Law on Foreign Investment in Vietnam (Law No. 18/2000/QH10).

Five years later, two new laws, the Law on Investment or the Common Investment Law in 2005 (Law No. 59/2005/QH11) and the Law on Enterprise or the Unified Enterprise Law in 2005 (Law No. 60/2005/QH11), were promulgated by the National Assembly and known as the first outstanding national commitments to treat both private and foreign investors alike in Vietnam. More recently, in

2014, these laws were completely replaced by the Law on Investment (Law No. 67/2014/QH13) and the Law on Enterprise (Law No. 68/2014/QH13) which took effect on 26 November, 2014 and 1 July, 2015, respectively.

Table 2.2 A Summary of the Important Laws Related to FDI in Vietnam

Year	Documentation	Description	Date of issue	Effective date	Status
2014	Law No. 67/2014/QH13	The Law on Investment	26/11/2014	26/11/2014	Effective
2014	Law No. 68/2014/QH13	The Law on Enterprise	26/11/2014	01/07/2015	Effective
2005	Law No. 59/2005/QH11	The Law on Investment	29/11/2005	01/07/2006	Ineffective
2005	Law No. 60/2005/QH11	The Law on Enterprise	29/11/2005	01/07/2006	Ineffective
1996	Law 1996	The Law on Foreign Investment in Vietnam	12/11/1996	12/11/1996	Ineffective
1987	Law No. 4-HĐNN8	The Law on Foreign Investment in Vietnam	29/12/1987	29/12/1987	Ineffective

Source: Information collected from MPI (2016)

Vietnam integrated into the regional and global economies by joining ASEAN in July 1995, AFTA in December 1995, APEC in November 1998, the United States – Vietnam BTA in July 2000, the WTO in January 2007, and the TPP in February 2016 (see Figure 2.8). Because of Vietnam's commitments under the WTO and trade agreements with the US and other countries, which require national

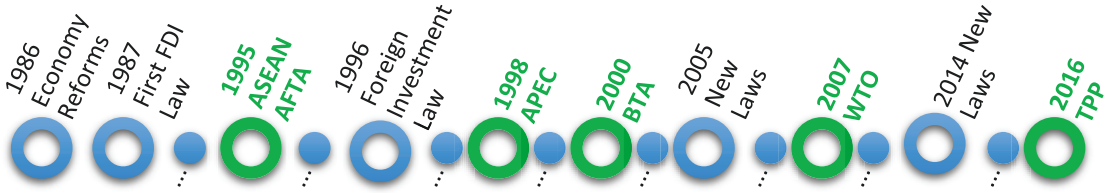


Figure 2.8 The Important Law and Regulation Milestones Related to FDI in Vietnam

treatment after phase-in periods, the needs of foreign and domestic investors with regard to regulatory policies have been converged by the Vietnamese law system. The laws in 2005, the recent equalization of income taxes between foreign and private firms regulated by the Law on Enterprise Income Tax (Law No. 14/2008/QH12 dated 03/06/2008), and the laws in 2014 are some of the first steps in enshrining these commitments into the national legal system.

2.3.2 FDI Attraction in Vietnam

After the first FDI law in 1987 had taken effect, Vietnam attracted the first FDI projects in 1988. Following this, the number of inward FDI licensed projects increased rapidly from 211 in 1988-1990 to 2,120 projects in 2015. In total there have been 21,397 projects for the 28 years from 1988 to 2015. The total registered capital including supplementary capital to licensed projects is 358,588.9 million USD (see Table 2.3).

Table 2.3 The Inward FDI to Vietnam 1988-2015

Year	Number of projects	Total registered capital[4]	Total implemented capital	
		Million USD	Million USD	% over total registered capital
1988-1990	211	1603.5	..	..
1991	152	1284.4	428.5	33.36
1992	196	2077.6	574.9	27.67
1993	274	2829.8	1117.5	39.49
1994	372	4262.1	2240.6	52.57
1995	415	7925.2	2792.0	35.23
1996	372	9635.3	2938.2	30.49
1997	349	5955.6	3277.1	55.03
1998	285	48734.0	2372.4	4.87
1999	327	2282.5	2528.3	110.77
2000	391	2762.8	2398.7	86.82
2001	555	3265.7	2225.6	68.15
2002	808	2993.4	2884.7	96.37
2003	791	3172.7	2723.3	85.84
2004	811	4534.3	2708.4	59.73
2005	970	6840.0	3300.5	48.25
2006	987	12004.5	4100.4	34.16
2007	1544	21348.8	8034.1	37.63
2008	1171	71726.8	11500.2	16.03
2009	1208	23107.5	10000.5	43.28
2010	1237	19886.8	11000.3	55.31
2011	1191	15618.7	11000.1	70.43
2012	1287	16348.0	10046.6	61.45
2013	1530	22352.2	11500.0	51.45
2014	1843	21921.7	12500.0	57.02
2015	2120	24115.0	14500.0	60.13
Total	**21397**	**358588.9**	**138692.9**	**38.68**

Source: Data collected from GSO (2016h) and GSO (2015b).

According to Table 2.3, the total implemented FDI capital reached 138,692.9 million USD, which accounted for 38.68% of the total registered capital between 1988 and 2015. On average, the amount of implemented FDI capital was 4,953.32 million USD per year (see Table 2.4). Over the 16 years from 2000 to 2015, Vietnam attracted 18,444 projects (1,153 projects per year) with a total

[4] Including supplementary capital to licensed projects in previous years

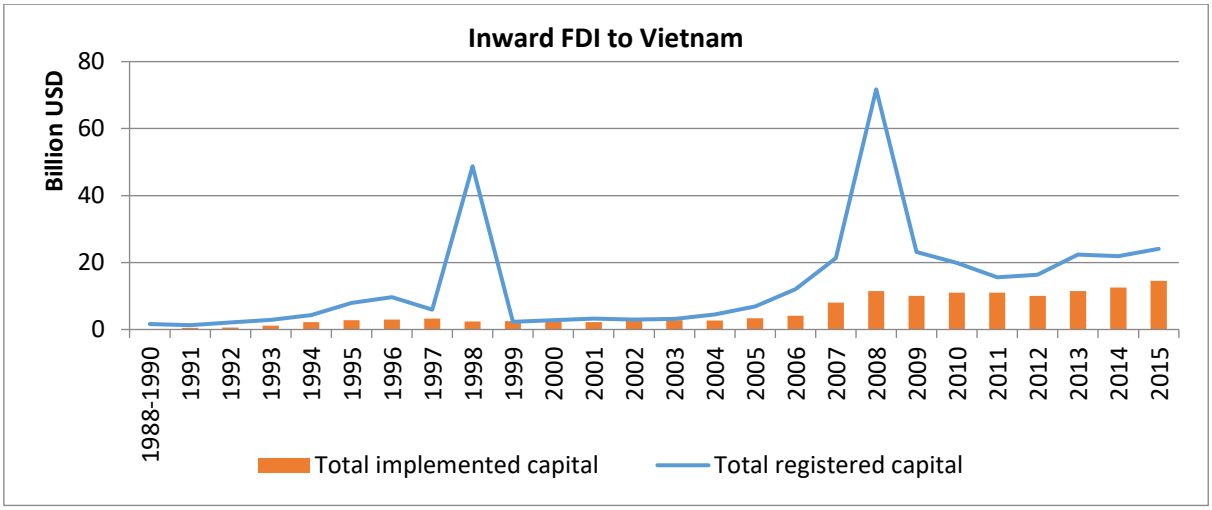
implemented FDI capital of 120,423.4 million USD (constituting 44.27% total registered capital) or 7,526.46 million USD per year (see Table 2.4). It can be seen clearly from Table 2.4 that, compared with 1988-2015, most of the capital was invested in this 16-year period with 86.2% of total projects and 75.85% of total registered capital.

Table 2.4 The Inward FDI to Vietnam 2000-2015 Compared with 1988-2015

	Unit	1988-2015		2000-2015		
		Total	Average	Total	% over 1988-2015	Average
Number of projects	Projects	21,397	764	18,444	86.20	1,153
Total registered capital	Million USD	358,588.90	12,806.75	271,998.90	75.85	16,999.93
Total implemented capital	Million USD	138,692.90	4,953.32	120,423.40	86.83	7,526.46
	%	38.68	-	44.27	-	-

Source: Data collected from GSO (2016h) and GSO (2015b), and computed by the author.

Although the annual registered FDI capital in Vietnam rose rapidly to 24,115 million USD in 2015 (15 times increase compared with 1988-1990), the figure fluctuated rapidly over the 28-year period (see Figure 2.9). The figure shows that, after the Asian financial crisis in 1997, the registered capital fell dramatically from under 50 billion USD in 1998 to over two billion USD in 1999 and recovered gradually in the 2000s.



Source: Data collected from GSO (2016h) and GSO (2015b).

Figure 2.9 The Inward FDI to Vietnam 1988-2015

Because of the significant changes in the investment environment supported by the new laws in 2005 and accession to the WTO in 2007 (Nguyen et al., 2012), the registered capital of FDI licensed projects in Vietnam significantly grew from 21 billion USD in 2007 to 71 billion USD in 2008 (see Figure 2.9). The implemented FDI capital has reached over 10 billion USD since 2008 after maintaining a low level of only 2 billion USD on average from 1988 to 2006 (see Table 2.3 and Figure 2.9). However, after the 2008 world financial crisis, there was a significant decrease in the registered

capital of almost 50 billion USD in 2010 in Vietnam. The amount dropped to 15.6 billion USD in 2011 before it recovered to vary around 22 billion USD between 2013 and 2015 (see Figure 2.9).

Table 2.5 The Social Investment Structure by Capital Source in Vietnam 1995-2015 (Total Social Investment = 100%)

Year	State sector (%)	Non-state sector (%)	FDI sector (%)
1995-2015	***46.2***	***32.1***	***21.7***
1995	42.0	27.6	30.4
1996	49.1	24.9	26.0
1997	49.4	22.6	28.0
1998	55.5	23.7	20.8
1999	58.7	24.0	17.3
2000	59.1	22.9	18.0
2001	59.8	22.6	17.6
2002	57.3	25.3	17.4
2003	52.9	31.1	16.0
2004	48.1	37.7	14.2
1995-2004	***53.2***	***26.2***	***20.6***
2005	47.1	38.0	14.9
2006	45.7	38.1	16.2
2007	37.2	38.5	24.3
2008	33.9	35.2	30.9
2009	40.5	33.9	25.6
2010	38.1	36.1	25.8
2011	37.0	38.5	24.5
2012	40.3	38.1	21.6
2013	40.4	37.7	21.9
2014	39.9	38.4	21.7
2015	38.0	38.7	23.3
2005-2015	***39.8***	***37.4***	***22.8***

Source: Data collected from GSO (2016j) and GSO (2015c).

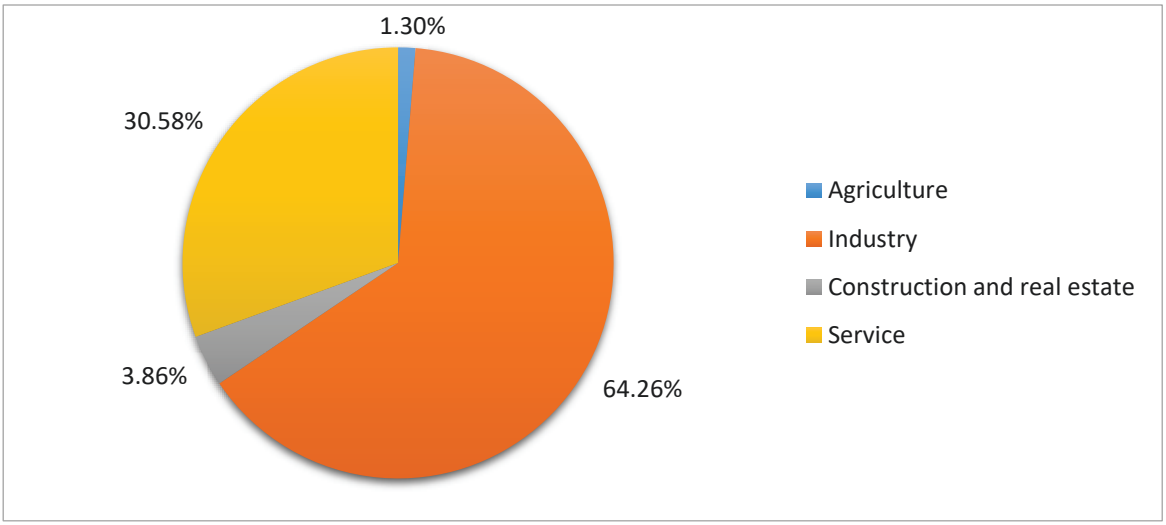
In Vietnam, FDI has importantly contributed to the total capital invested in development (GSO, 2016f). Table 2.5 describes the country's social investment structure from the capital sources of the state-owned sector, non-state-owned sector and foreign invested sector from 1995 to 2015. The table shows that even though the FDI sector instituted 20.57% total social investment, on average, in 1995-2004 and rose to 22.79% in 2005-2015, the rate of state sector capital fell from 53.19% to 39.83%. However, since 2009, the contribution rate of FDI gradually decreased after peaking at 30.9% in 2008 (see Table 2.5). In 2015, the proportion of non-state sector capital was highest at 38.7% (529,600 million VND), followed by the state sector ranked second with 38% (519,500 million VND), and the FDI sector at 23.3% (318,100 million VND) of the total social capital of Vietnam (see Figure 2.3 and Table 2.5).

Table 2.6 FDI Projects Licensed by Kind of Economic Activity in Vietnam (accumulated total of projects in effect as at 31 December, 2015)

Economic activity	Number of projects		Total registered capital[5]	
	Projects	%	Million USD	%
Agriculture	521	2.60	3654.9	1.30
Industry	11013	54.88	181141.2	64.26
Construction and real estate	1264	6.30	10893.8	3.86
Services	7271	36.23	86192.6	30.58
Total	**20069**	**100**	**281882.5**	**100**

Source: Data collected from GSO (2016f) and computed by the author.

In terms of economic activity, Table 2.6 shows that the FDI capital in Vietnam was mainly invested in industrial activities. From 1988 to 2015, Vietnam attracted 21,397 projects[6] (see Table 2.3), of which over 20 thousand projects were operating (or in effect) based on an accumulative data of FDI



Source: Data collected from GSO (2016f) and computed by the author.

Figure 2.10 The Accumulated Registered Capital Structure of FDI Projects as at 31 December, 2015, by Kind of Economic Activity in Vietnam

projects collected from GSO (2016f). According to Table 2.6, the total number of projects was 20,069, of which 11 thousand (accounting for 54.88%) focused on developing industries, 7.2 (36.23%) on service activities, and of the remaining 6.3% were in construction and real estate and 2.6% were in agriculture. The total registered FDI capital of the industrial sector was highest at 181,141.2 million USD (64.26%) and the service sector was second with 86,192.6 million USD (30.58%) (see Table 2.6).

[5] Includes supplementary capital to licensed projects in previous years

[6] The total number of licensed FDI projects from 1988 and 2015 includes: (1) licensed projects are operating (projects in effect); and (2) others that have not operated or stopped operating.

Based on the data from GSO (2015a), the percentage of the population in rural Vietnam was over 66%; the labour force at 15 years of age and above in rural areas constituted 68.7% of the country's total labour force, and the agriculture sector contributed 17% to the GDP (at current prices) in 2015. Table 2.6 and Figure 2.10 indicate that the registered FDI capital in agricultural activities was only 1.3% of the total registered capital (including supplementary capital to licensed projects in previous years), which is not commensurate with the country's agricultural development potential.

Table 2.7 The Vietnam FDI Projects Licensed by the Main Contributors (accumulated total as at 31 December, 2015)

	Number of projects		Total registered capital[7]	
Unit	**Projects**	**%**	**Million USD**	**%**
Total	**20069**	**100**	**281882.5**	**100**
Country				
Republic of Korea	4970	24.76	45191.1	16.03
Japan	2914	14.52	38973.6	13.83
Singapore	1544	7.69	35148.5	12.47
Taiwan	2478	12.35	30997.4	11.00
British Virgin Islands	623	3.10	19275.3	6.84
Hong Kong SAR[8] (China)	975	4.86	15546.8	5.52
Malaysia	523	2.61	13420.1	4.76
United States	781	3.89	11301.8	4.01
China, PR[9]	1296	6.46	10174.2	3.61
Netherlands	255	1.27	8264.5	2.93
Thailand	419	2.09	7727.9	2.74
Cayman Islands	67	0.33	6392.3	2.27
Samoa	150	0.75	5771.7	2.05
Canada	147	0.73	5252.7	1.86
United Kingdom	241	1.20	4739.3	1.68
France	448	2.23	3423.0	1.21
Russia	113	0.56	2080.1	0.74
Switzerland	111	0.55	2045.1	0.73
Australia	357	1.78	1652.7	0.59
Germany	260	1.30	1393.7	0.49

Source: Data collected from GSO (2015d) and computed by the author.

In terms of investment counterparts, the inward FDI for Vietnam was mostly from Asia between 1988 and 2015 (see Table 2.7). The proportion of FDI from East Asia including the Republic of Korea, Japan, Taiwan, and China (Hong Kong and Mainland China) made up around 63% of total projects and 50% total registered capital. Singapore, Malaysia and Thailand, that are ASEAN members, contributed over 12% of total FDI projects with nearly 20% of total registered capital. Vietnam attracted only a small percentage of FDI from developed countries including the US, Canada, the United Kingdom,

[7] Total registered capital includes supplementary capital to licensed projects in previous years.
[8] SAR stands for Special Administrative Region.
[9] PR stands for Peoples' Republic.

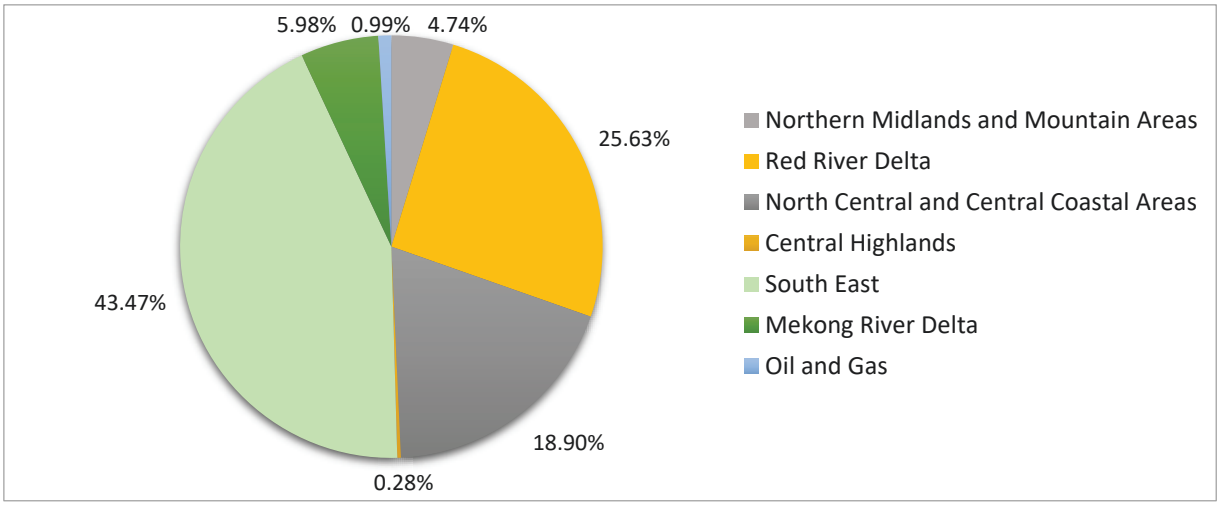
France, Russia, Switzerland, Australia, and Germany (around only 12% of the total projects and about 11% of the total capital, see Table 2.7).

Table 2.8 The Number and Value of FDI Projects Licensed by Vietnam Region (accumulated total as at 31 December, 2015)

Region	Number of projects		Total registered capital[10]	
Unit	Projects	%	Million USD	%
Total	**20069**	**100**	**281882.5**	**100**
1. Northern Midlands and Mountain Areas	617	3.07	13369.0	4.74
2. Red River Delta	6186	30.82	72257.9	25.63
3. North Central and Central Coastal Areas	1236	6.16	53278.0	18.90
4. Central Highlands	131	0.65	781.7	0.28
5. South East	10686	53.25	122544.5	43.47
6. Mekong River Delta	1162	5.79	16867.7	5.98
Oil and Gas	51	0.25	2783.7	0.99

Source: Data collected from GSO (2015d) and computed by the author.

It can be seen from Table 2.8 that the FDI distribution was uneven among the six Vietnam regions. Most of the FDI capital was invested in the South East region (53.25% of the total number and 43.47% of the total registered capital between 1988 and 2015); only 5.79% of total FDI projects and 5.98% of the total registered value was in the Mekong River Delta, which is southern Vietnam. Appendix Table A.8 provides additional information on the FDI projects licensed by region in Vietnam.



Source: Data collected from GSO (2015d) and computed by the author.

Figure 2.11 The Accumulated Registered Capital Structure of FDI Projects by Vietnam Region as at 31 December, 2015

[10] Total registered capital includes supplementary capital to licensed projects in previous years.

In the north, the FDI projects and registered capital in the Red River Delta were the second highest (30.82% and 25.63%, respectively), whereas in the Northern Midlands and Mountain Areas, they were very low (3.07% and 4.74%) (see Table 2.8 and Figure 2.11). In the middle of Vietnam, the North Central and Central Coastal Areas attracted 18.9% of the total registered capital, but very few FDI projects (accounting for 0.28% of the total registered capital) were located in the Central Highlands (see Table 2.8 and Figure 2.11). This implies that foreign investors did not prefer investing in the midland, highland and mountain regions of Vietnam, which could increase the unequal development and income in those provinces and cities.

Unequal distribution of FDI was also reported at the Vietnam provincial level. Table 2.9 lists 20 cities and provinces that attracted the most and least FDI registered capital between 1988 and 2015 (including only projects in effect).

Table 2.9 Vietnam Cities or Provinces Attracting the Most and Least FDI Registered Capital (accumulated total as at 31 December, 2015)

Ranking position	City or Province	Number of projects	Total registered capital (Million USD)	Ranking position	Cities or Provinces	Number of projects	Total registered capital (Million USD)
1	Ho Chi Minh city	5886	42366.8	55	Quang Binh	12	109.1
2	Ba Ria - Vung Tau	322	27766.4	56	Dong Thap	17	105.5
3	Ha Noi city	3467	25490.9	57	Bac Lieu	17	94.2
4	Binh Duong	2731	24026.0	58	Quang Tri	21	85.6
5	Dong Nai	1350	24025.9	59	Kon Tum	2	70.2
6	Hai Phong city	513	11651.3	60	Cao Bang	24	51.2
7	Bac Ninh	721	11328.3	61	Dak Nong	6	19.6
8	Ha Tinh	64	11265.0	62	Bac Kan	6	14.3
9	Thanh Hoa	71	10409.1	63	Gia Lai	5	9.7
10	Hai Duong	376	7385.2	64	Lai Chau	3	4.0

Source: Data collected from GSO (2015d) and computed by the author.

The top five provinces and cities attracting FDI (see Table 2.9) include Ho Chi Minh city (ranked first in both number of projects and registered capital), Ba Ria – Vung Tau (second in registered capital), Ha Noi city - the capital of Vietnam - (ranked second in the number of projects and third in registered capital), Binh Duong (ranked fourth), and Dong Nai (ranked fifth). Interestingly, four of the top five provinces and cities are in the South East region of Vietnam.

Among the 64 provinces and cities, Lai Chau ranked last with only three FDI projects (4 million USD) over 28 years. At 63rd, 62nd and 61st positions were Gia Lai with less than 10 million USD FDI in total, Bac Kan (14.3 million USD) and Dak Nong (19.6 million USD), respectively. Lai Chau and Bac Kan are in the Northern Midlands and Mountain Areas, and Gia Lai and Dak Nong are in the Central Highlands

of Vietnam; all four provinces have extremely difficult socio-economic conditions and are listed as areas eligible for investment incentives (regulated by Appendix II promulgated together with the Government's Decree No. 118/2015/NĐ-CP dated 12/01/2015 on guidelines for some articles of the Law on Investment 2014 (Government, 2015)).

Table 2.10 The Percentage Contribution of FDI Enterprises to Vietnam's Economy

Economic Category	Percentage Contribution		
	2005	2010	2014
1. To job solution	2.7	4.4	6.4
2. To state budget revenue	8.4	11.0	13.9
3. To export value	57.2	54.2	62.5
4. To Vietnam GDP	15.2	15.2	16.4
% FDI capital in the social investment structure	**14.9**	**25.8**	**21.7**

Source: Data collected from GSO (2016f), GSO (2016j) and GSO (2015d)

Although the distribution of FDI in Vietnam was unequal within the country, in general, FDI has significantly contributed to the economy in terms of creating jobs, increasing state budget revenue, supporting exports, and boosting the EG (GSO, 2016f). Table 2.10 shows the outstanding role of FDI's contribution to Vietnam's export value of 57.2% in 2005 and 62.5% in 2014, which means that FDI significantly supported the nation's international trade development. The level of FDI enterprises' contribution to jobs for local employees over the total working force was not very high but increased gradually from 2.7% in 2005 to 6.4% in 2014. However, compared with the FDI capital rate of 22.8% in the social investment structure in the period 2005-2015 (see Table 2.5), the contribution of FDI to GDP and the state budget revenue of Vietnam was modest (see Table 2.10). It can be clearly seen from Table 2.10 that the contribution of FDI to GDP rose by only 1.2% in 15 years (remained at 15.2% from 2005 to 2010 and slightly grew to 16.4% in 2014). In 2014, though the FDI sector contributed 16.4% to GDP, the contribution of FDI to the state budget revenue was only 13.9%, which was much lower than that of FDI capital (21.7%) to the social investment structure (see Table 2.10).

In summary, since 1987, Vietnam has made concerted efforts to improve the law and regulation systems related to FDI to ensure international commitments after integrating into the regional and global economy. Consequently, the number of FDI licensed projects and the total registered capital increased dramatically, 20,069 projects worth 281,882.5 million USD in 2015 (see Table 2.6). In addition, FDI contributed more than one fifth of the total social investment in Vietnam between 1995 and 2015 (see Table 2.5). Remarkably, FDI has played an important role in supporting exports with a contribution rate of over 62% in 2014 (see Table 2.10). However, Vietnam has faced some difficulties in attracting and managing FDI. In terms of the investment contributors[11], Vietnam's inward FDI was mostly from Asia; only a small percentage of FDI came from developed countries (see Table 2.7). The

[11] Main foreign investors in Vietnam by countries

FDI distribution has been unequal in terms of the types of economic activity as well as among regions, provinces and cities (see Tables 2.8, 2.9, and Figure 2.11), which can increase the inequality of development and income. Although FDI has contributed to Vietnam's economy, the proportions of FDI in creating jobs, increasing state budget revenue, and in boosting the EG were quite modest compared with the FDI capital rate to the social investment structure (see Table 2.10).

2.4 Conclusion

This overview of Vietnam's socio-economic development and FDI attraction illustrates that the nation has had some advantages with regard to the socio-economic development, such as the high labour force rate, low unemployment rate, and high and steady GDP growth rate. However, the country has faced difficulties in using the capital efficiently, controlling inflation and administering international trade. In terms of the FDI attraction, since 1987, Vietnam has improved its law and regulation systems related to FDI and has experienced rapid increase in the number of FDI licensed projects and the total registered capital between 1988 and 2015. Although FDI has played an important role in contributing highly to Vietnam's total social investment and exports, the contribution of FDI to creating jobs, increasing state budget revenue, and boosting EG were quite modest compared with the FDI capital rate to social investment. Further, the country has faced unequal FDI distribution among economic activities as well as among regions, provinces and cities. Vietnam attracted FDI mostly from Asia; only a small percentage of FDI came from developed countries.

Chapter 3

Literature Review

3.1 Introduction

This chapter reviews the literature related to inward FDI to identify gaps in the Vietnam context. Section 3.2 provides worldwide evidence of FDI-EG linkages, which shows a lack of studies investigating a long-run two-way relationship between FDI and EG. Section 3.3 reviews the determinants affecting FDI positively, negatively, and both positively and negatively. Empirical studies of inward FDI in Vietnam are summarised in Section 3.4 in terms of the five research topics: the relationship between FDI and EG, FDI provincial competition, the effects of policies on FDI, the effects of laws on FDI, and FDI location selection. Section 3.5 identifies the gaps, research directions, and hypotheses. Section 3.6 concludes the chapter.

3.2 The Relationship between FDI and EG

The relationship between FDI and EG has been studied in developed (high income) and developing economies[12]. The FDI-EG linkage studies in developed economies[13] include 16 EU countries: Austria, Belgium, Cyprus, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Malta, the Netherlands, Portugal, Spain, Sweden, and the United Kingdom (Moudatsou & Kyrkilis, 2011; Andraz & Rodrigues, 2010); Singapore (Moudatsou & Kyrkilis, 2011; Srinivasan et al., 2010); five EU economies from the CEE: Czech Republic, Hungary, Poland, Slovakia, and Slovenia (Kornecki & Rhoades, 2007). With regard to developing economies, the nexus between FDI and EG was investigated in Kenya (Kinuthia & Murshed, 2015); the BRICS economies, i.e., Brazil, Russia, India, China and South Africa (Labes, 2015); Malaysia (Kinuthia & Murshed, 2015; Srinivasan et al., 2010); 13 MENA countries, i.e., Algeria, Bahrain, Egypt, Iran, Jordan, Kuwait, Lebanon, Morocco, Oman, Qatar, Saudi Arabia, Tunisia, and the United Arab Emirates (Omri & Kahouli, 2014); China (Wen, 2013; Wei & Li, 2011; Guo & Luo, 2009; Li & Shen, 2008; Yao, Feng, & Wei, 2006; Sun, 2002); Vietnam (Nguyen & Ho, 2013; Nguyen, Zhang, & Tran, 2012; Hoang et al., 2010; Srinivasan et al., 2010); eight Islamic countries (Razmi & Behname, 2012); Indonesia and the Philippines (Moudatsou & Kyrkilis, 2011; Srinivasan et al., 2010); Thailand (Moudatsou & Kyrkilis, 2011; Srinivasan et al., 2010; Thanyakhan, 2008); and Brunei, Laos, and Myanmar (Srinivasan et al., 2010) .

[12] The term countries, used interchangeably with economies, does not imply political independence but refers to territories for which authorities report separate social or economic statistics.
[13] The classification of the economies is based on the WB (2016a)

However, not many studies investigate the bi-directional relationship between FDI and EG. In the last 10 years, Kinuthia and Murshed (2015), Omri and Kahouli (2014), Moudatsou and Kyrkilis (2011), Andraz and Rodrigues (2010) and Srinivasan et al. (2010) have found a two-way causal link between FDI and EG (see Table 3.1). Except for Andraz and Rodrigues (2010) and Srinivasan et al. (2010), most researchers did not study the long-term relationship.

In terms of the bi-directional linkage, Kinuthia and Murshed (2015) studied the relationship between FDI and EG in two developing countries, Malaysia and Kenya, by estimating a Vector Error Correction Model (VECM). Their empirical analysis, based on time series data from 1960 to 2009, indicates that a two-way causal link exists only in Malaysia by testing for the short-run Granger causality between FDI and Gross National Income (GNI). A two-way nexus between FDI and EG was also found by Omri and Kahouli (2014) in a study of 13 MENA countries (see above). The authors use the Generalised Method of Moments (GMM) to test simultaneous-equation models based on a growth model framework and a panel data between 1990 and 2010.

The bi-directional relationship between FDI and EG was examined by Moudatsou and Kyrkilis (2011) in two economic associations, the EU and ASEAN, from 1970 to 2003. The authors applied a four-stage procedure of the Unit Root, Johansen's approach, the Johansen (1988) cointegration test and the ECM technique. Their results revealed a two-way causality between GDP per capita and FDI in Indonesia and Thailand. The other two ASEAN countries (Singapore and the Philippines) and the 16 EU countries (see above) experienced a one-way causality of GDP-to-FDI.

In terms of the long-term relationship between FDI and EG, Andraz and Rodrigues (2010) show a bi-directional causal relationship between FDI and EG in the short run and concluded that FDI was a major factor in boosting growth via exports in the short and long term in Portugal. The authors used a three-stage procedure including the Dickey-Fuller unit root test, the Johansen-Juselius cointegration test, and the Granger causality test applied to annual data from 1977 to 2004.

Srinivasan et al. (2010) studied ASEAN nations. The authors used the Johansen cointegration test to establish a long-run nexus between FDI and GDP for Indonesia, Malaysia, Philippines, Singapore and Vietnam. They then employed the VECM, which revealed a long-run GDP-to-FDI causality in Indonesia, the Philippines and Singapore; and a long-run two-way nexus between GDP and FDI in Malaysia and Vietnam. The standard Granger Causality test showed no link between the two variables in Brunei and Laos, but a one-way relationship of GDP-to-FDI and FDI-to-GDP in the short run in Myanmar and Thailand, respectively.

Table 3.1 A Summary of Selected Empirical Studies on the Relationship between FDI and EG

Author(s)	Countries	Time	Method(s)	Do FDI and GDP have any relationship?		Is a long-term relationship studied? Results?	
				Yes	No	Yes	No
Kinuthia and Murshed (2015)	Kenya and Malaysia	1960-2009	VECM	FDI⇄GNI: Malaysia GNI→FDI: Kenya			No
Labes (2015)	BRICS (Brazil, Russia, India, China and South Africa)	1992-2012	OLS pooled regression with random effects method	GDP per capita→FDI			No
Omri and Kahouli (2014)	13 MENA countries (Algeria, Bahrain, Egypt, Iran, Jordan, Kuwait, Lebanon, Morocco, Oman, Qatar, Saudi Arabia, Tunisia, and UAE)	1990-2010	A 'growth model' framework & simultaneous-equation models estimated by GMM	FDI⇄ GDP growth			No
Razmi and Behname (2012)	8 Islamic countries	1985-2009	OLS with random effects model	Growth→FDI			No
Moudatsou and Kyrkilis (2011)	EU & ASEAN	1970-2003	A four-stage procedure based on the Unit Root, Johansen's approach, the Johansen (1988) Co-integration Test, and the Error Correction Mechanism technique	Growth → FDI: EU ASEAN: FDI⇄ GDP per capita: Indonesia &Thailand Growth → FDI: Singapore & the Philippines			No
Andraz and Rodrigues (2010)	Portugal	1977-2004	A three-stage procedure based on Unit Root, Cointegration and Causality	FDI⇄ EG		Yes; long-term	
Srinivasan et al. (2010)	ASEAN	1970-2007	Johansen Cointegration technique followed by the VECM and standard Granger Causality	FDI⇄ GDP: Malaysia & Vietnam GDP→FDI: Indonesia, Philippines, Singapore, & Thailand FDI→GDP (Myanmar)	No: Brunei Darussalam & Laos People's Democratic Republic	Yes; long-term (Indonesia, Malaysia, Philippines, Singapore, and Vietnam) Yes; short-term (Myanmar and Thailand)	
Thanyakhan (2008)	Thailand	1980-2004	Extended Gravity Model	GDP→FDI			No
Kornecki and Rhoades (2007)	CEE: Hungary, Czech Republic, Poland, Slovakia and Slovenia	1990-2001	Correlation Coefficient	FDI→GDP			No

Other researchers mostly studied the one-way linkage between EG and FDI. Labes (2015) finds that GDP per capita had a significant positive relationship with FDI (the EG-to-FDI nexus) in BRICS economies based on panel data between 1992 and 2012. The author employed an OLS pooled regression with a random effect method and checked the robustness with the Hausman Test. Employing the same method for a balanced panel data, Razmi and Behname (2012) find that eight Islamic countries' FDI was significantly impacted by EG from 1985 to 2009. In Thailand, GDP growth exhibited a positive effect on attracting FDI (Thanyakhan, 2008) based on the extended Gravity Model of a panel data between 1980 and 2004. In terms of the FDI-to-EG nexus, countries from the CEE experienced a one-way relationship from 1990 to 2005 (Kornecki and Rhoades, 2007). According to these authors, foreign capital plays a vital role in producing more goods and services and increases the average capital to labour ratio in the Czech Republic, Hungary, Poland, Slovakia and Slovenia.

In summary, most previous researchers did not investigate the bi-directional relationship between FDI and EG for a long period. This study investigates the long-term bi-directional relationship between FDI and EG in Vietnam.

3.3 Determinants of FDI

FDI determinants have been studied broadly by many researchers (see Table 3.2). The studies show that, besides EG, many other factors have been considered as key drivers that can boost or impede the flow of FDI. Though some factors played a positive role in the FDI flow (Kinuthia & Murshed, 2015; Labes, 2015; Castiglione et al., 2012), other factors had an adverse effect (Kinuthia & Murshed, 2015; Kumari, 2014; Pradhan, 2012; Razmi & Behname, 2012; Haq, 2001).

Some relatively recent studies identified GDP per capital, market size, trade openness, exchange rate, stable inflation, infrastructure development, domestic investment, technology, geographical position, governance, and democracy as positive determinants in attracting FDI. For example, GDP per capita, trade openness and exchange rate exhibit a significant positive relationship with FDI in the BRICS economies from 1992 to 2012 (Labes, 2015). According to Kinuthia and Murshed (2015), stable inflation and trade openness positively impact the attraction of FDI to both Kenya and Malaysia from 1960 to 2009. FDI in Kenya was well supported by the development of infrastructure and democracy, whereas an increase in FDI in Malaysia is because of the exchange rate and governance. Castiglione et al. (2012), based on data for 79 Russian regions from 1996 to 2001, show market size (gross regional product per capita, population size), coastal position, infrastructure improvements, and domestic investments are positive determinants of FDI. Pradhan (2012) identifies power availability indicating partly that the development of infrastructure and domestic investment as being two key determinants of FDI in 16 Indian states between 2001 and 2010. Technological factors were also identified as important determinants in attracting FDI to the US (Haq, 2001).

According to Haq (2001), expenditure on research and development (R&D) and patents, which demonstrate the capabilities of host countries' technology, exhibit a strong positive relationship with FDI in the US between 1997 and 1998.

On the other hand, negative determinants of FDI were found by Kinuthia and Murshed (2015), Kumari (2014), Pradhan (2012), Razmi and Behname (2012), and Haq (2001). Though Haq (2001) shows that exchange rate variation and cultural distance between home and host-country had a significant negative impact on FDI in the US's manufacturing industries, Kumari (2014) identifies a higher level of unemployment, the existence of poverty, excessive population, a higher level of risk, and corruption in the host countries as other negative determinants of FDI. Kinuthia and Murshed (2015) reveal that wages and financial development levels significantly negatively affect FDI in both Kenya and Malaysia from 1960 to 2009. The volatility of profit is another factor impacting negatively on FDI for 16 Indian states between 2001 and 2010 (Pradhan, 2012). Razmi and Behname (2012) find that inflation rate, oil extraction and openness had a negative effect on attracting FDI in to eight Islamic countries from 1985 to 2009.

Some researchers have conducted studies related to the determinants of investors' decisions about where to locate capital. Important factors identified include improved democracy (Hasan & Mahvash, 2015), higher education levels and lower delinquency rates (Escobar, 2013), and political stability and security (Castiglione et al., 2012).

Based on panel data of five countries (Malaysia, the Philippines, Singapore, Thailand and Turkey) from 1990 to 2012, Hasan and Mahvash (2015) find improved democracy positively affects investors' decisions about where to locate capital. The study employed a four step method of the panel unit root tests, the Panel cointegration (the Pedroni test), the Hausman Test, and the Generalised Least Square (GLS) technique. The authors' result shows that low corruption, inflation, high openness, literacy rate and infrastructure significantly support FDI in those nations.

Escobar (2013) investigated the location pattern of FDI in Mexico from 1994 to 2004 using data at a state-level and employed spatial econometric techniques. The author's results indicate that higher education levels and lower delinquency rates are important determinants of where foreign investors allocate their capital in Mexico's states.

Table 3.2 A Summary of Selected Empirical Studies on FDI Determinants for Various Countries

Study	Country(ies)	Years	Data	Level	Method(s)	Significant Determinants	
						Positive	Negative
Hasan and Mahvash (2015)	Malaysia, Philippine, Singapore, Thailand and Turkey	1990-2012	Panel	Country	Panel unit root test → Panel cointegration (Pedroni) test → Hausman and Likelihood → GLS	Openness, literacy rate and infrastructure FDI location: Democracy	Corruption, inflation
Kinuthia and Murshed (2015)	Kenya and Malaysia	1960-2009	Time-series	Country	VECM	Both: Trade openness, stable inflation	Both: Wages, financial development,
						Kenya: Infrastructure development, improved democracy	Kenya: Exchange rate
						Malaysia: Governance, exchange rate	
Labes (2015)	BRICS (Brazil, Russia, India, China and South Africa)	1992-2012	Panel	Country	OLS pooled regression with random effects method	GDP per capita, trade openness, exchange rate	
Omri and Kahouli (2014)	13 MENA countries (Algeria, Bahrain, Egypt, Iran, Jordan, Kuwait, Lebanon, Morocco, Oman, Qatar, Saudi Arabia, Tunisia, and UAE)	1990–2010	Panel	Country	A 'growth model' framework & simultaneous-equation models estimated by GMM	GDP, openness, higher education	Exchange rate
Escobar (2013)	Mexico	1994-2004	Time-series & Time-trend	State	Spatial econometric techniques	FDI location: Education levels	FDI location: Delinquency rates
Castiglione et al. (2012)	79 Russian regions	1996-2001	Cross-sectional and Panel	Regional	OLS, Prais-Winsten, GMM	Market size (gross regional product per capita, population size); coastal position; infrastructure improvements; domestic investments FDI location: Political stability and security	

Study	Country(ies)	Years	Data	Level	Method(s)	Significant Determinants	
						Positive	Negative
Pradhan (2012)	16 Indian states	2001-2010	Panel	State	OLS with 3 fixed-effect models (within-group, first difference, Least Square Dummy Variable (LSDV)	Availability of power, domestic investment	Volatility of profit
Razmi and Behname (2012)	8 Islamic countries	1985-2009	Panel	Country	OLS with random effects model	EG	Inflation rate, oil extraction, openness
Thanyakhan (2008)	Thailand	1980-2004	Panel	Country	Extended Gravity Model	GDP, trade	
Haq (2001)	The US	1997-1998	Panel	Country	OLS Regression Method	New patents and R&D expenditure; level of exports	Exchange rate variation, cultural distance

Castiglione et al. (2012) conducted a study investigating the determinants of FDI inflows in 79 Russian regions from 1996 to 2001. Based on cross-sectional and panel data, their results reveal that political stability and security played an important role in attracting FDI in Russia. The authors reveal that foreign investors consider Russia an ideal nation in which to allocate their capital in terms of stability and institutional factors.

However, the effects of FDI determinants do not remain unchanged over long periods (Zhao & Xiang, 2012; Huang & Chai, 2006; Sun, 2002). Five major factors, government policy, industrial structure, economic openness, human capital and the level of marketization, are believed to be important in influencing the location of FDI in China, but the effects of these factors exhibit structural changes in terms of different stages of economic development (Zhao & Xiang, 2012; Huang & Chai, 2006; Sun, 2002). The results of previous studies related to the FDI development in China also suggest that the role of tax incentives has been weakened gradually while some other factors, such as financial support, trade costs, and improved infrastructure, play more important roles in attracting FDI (Li & Shen, 2008; Huang & Chai, 2006). Based on Table 3.2, there are still debatable conclusions on the effects of some FDI determinants such as trade openness, exchange rate, and inflation. Though Razmi and Behname (2012) find that trade openness exhibits a negative impact on FDI, Hasan and Mahvash (2015), Kinuthia and Murshed (2015) and Labes (2015), show positive impacts of trade openness on FDI. Similarly, the exchange rate impacts FDI both positively (Kinuthia & Murshed, 2015; Labes, 2015) and negatively (Kinuthia & Murshed, 2015; Haq, 2001). Hasan and Mahvash (2015) and Razmi and Behname (2012) show that the inflation rate and FDI have a negative relationship, but it is positive in Kinuthia and Murshed's (2015) study.

3.4 Empirical Studies of Inward FDI in Vietnam

FDI is a popular topic in empirical studies in most countries including Vietnam. In general, empirical studies of inward FDI in Vietnam have focused on five main groups of topic: (i) the relationship between FDI and EG (Nguyen & Ho, 2013; Nguyen, Zhang, et al., 2012; Hoang et al., 2010; Srinivasan et al., 2010); (ii) FDI provincial competition (Nguyen & Ho, 2013; Nguyen, Ho, et al., 2012; Malesky, 2010; Nguyen & Nguyen, 2007); (iii) the effects of policies on FDI (Hoang & Goujon, 2014; Vu et al., 2009); the effects of laws on FDI (Nguyen & Ho, 2013; Nguyen, Zhang, et al., 2012; Pham, 2011); and (v) FDI location and industry selection (Hoang & Goujon, 2014; Vu et al., 2009; Nguyen & Nguyen, 2007). No research explores these five topics in a single study (see Table 3.3).

Table 3.3 shows that, at most, three of the five topics were investigated in one study. Both Nguyen and Ho (2013) and Nguyen, Ho, et al. (2012) study three topics, the FDI-EG relationship, FDI provincial competition, and the effects of laws on FDI in Vietnam. However, Nguyen, Ho, et al.'s

(2012) findings are based on panel data of only 14 provinces and cities in one region, the North Central and South Central Coast (NCSCC) areas, the other study uses a panel data of all 64 provinces and cities and six regions of the country. Other researchers focus on one or two of the five topics related to inward FDI in Vietnam (see Table 3.3).

According to Nguyen and Ho (2013), the relationship between FDI and EG in Vietnam is not the same in all provinces and regions. Their empirical results support a positive two-way nexus between FDI and GDP per capita growth in 64 provinces and cities, but that relationship appeared in only five of six Vietnam regions between 2001 and 2010. The regions with more difficulties in terms of socio-economic conditions experienced a tighter interaction between the two variables. Nguyen and Ho (2013) also find competition among Vietnam areas in attracting FDI. Further, both introducing new laws and Vietnam becoming a WTO member had a positive impact on FDI, but the effect of the laws was greater than that of WTO membership.

Table 3.3 A Summary of Selected Empirical Studies on FDI in Vietnam

Author(s)	Research Topics					Scale	Time	Method
	FDI and EG Relationship	**FDI Provincial Competition**	**Policy Effect on FDI**	**Laws Effect on FDI**	**FDI Location and Industry Selection**			
Hoang and Goujon (2014)			National and provincial economic policies		FDI distribution	Provinces in Vietnam	After the Asian crisis	Spatial econometric models
Nguyen and Ho (2013)	FDI ↔ GDP per capita	Sub-national competition (PCI)		Laws and WTO		64 Provinces and 6 Regions in Vietnam	2001-2010	Fixed - effects method
Nguyen, Ho, et al. (2012)	FDI ↔ GDP	Sub-national competition (PCI)		Laws and WTO		14 provinces in Vietnam	2001-2010	Fixed - effects method
Pham (2011)				WTO		Vietnam and 17 partner countries	1990-2008	An augmented gravity model
Hoang et al. (2010)	FDI → GDP					61 Provinces in Vietnam	1995-2006	Growth Model, OLS
Malesky (2010)		PCI → FDI				64 provinces in Vietnam	2006	OLS
Srinivasan et al. (2010)	FDI ↔ GDP					5 Countries including Vietnam	1970-2007	Johansen Cointegration technique, VECM Model and standard Granger Causality test
Vu et al. (2009)			Investment incentives		Investors' decisions	The mining and quarrying sector in Vietnam	2002-2006	Indirect two-step approach via a survey
Nguyen and Nguyen (2007)		PCI → FDI			FDI spatial distribution	Provinces and other partner countries	1988-2006	OLS

In the NCSCC areas of Vietnam between 2001 and 2010, the positive bi-directional linkage between FDI and EG was strong, especially in the extremely difficult socio-economic provinces (Nguyen, Ho, et al., 2012). It is believed that the higher total registered capital of licensed inward FDI projects is not

the result of better governance but better information and infrastructure. Both Nguyen, Ho, et al. (2012) and Nguyen and Ho (2013) find that FDI was positively impacted by the new laws and WTO membership in the whole country and the NCSCC, respectively.

Both Srinivasan et al. (2010) and Hoang et al. (2010) investigate one topic in FDI-EG linkages in their studies; Pham (2011) studied the WTO membership effects and Malesky (2010) focused on FDI provincial competition. Srinivasan et al. (2010) believe that a long-run two-way nexus between GDP and FDI exists in five countries, including Vietnam; and Hoang et al. (2010) find a strong, positive effect of FDI on EG in 61 Vietnamese provinces between 1995 and 2006. Pham (2011) shows that accessing WTO in 2007 had a significant positive effect on both imports and inward FDI in Vietnam between 1990 and 2008; and Malesky's (2010) study shows that better governance results in higher FDI implementation rates and encourages foreign investors to add more capital to current businesses in 64 provinces of Vietnam in 2006.

The effects of policies on FDI and the selection of FDI location and industry are two topics studied by Hoang and Goujon (2014) and Vu et al. (2009); Nguyen and Nguyen's (2007) study investigated FDI provincial competition and the selection of location and industry. FDI provincial competition and the selection of location and industry were studied by Nguyen and Nguyen (2007). Their empirical analysis shows that the FDI spatial distribution across Vietnam's provinces was determined by market, labour and infrastructure, but government policy was measured by the PCI. In addition, it is believed that foreign investors from different nations behave differently in making decisions about locating their capital. Hoang and Goujon (2014) employ spatial econometric models to investigate FDI distribution among Vietnam provinces after the 1997 Asian financial crisis. The authors show that both national and provincial economic policies play a significant important role in attracting FDI. It was also revealed that provinces that adopted extra-legal incentives actually reduced the amount of FDI per capita they receive in the year after adopting the incentives (Vu, 2007). However, this conclusion was based on only a small survey of foreign firms. According to Vu et al. (2009), Vietnam made great efforts to regulate sub-national incentives. Hence, the issue of whether investment incentives actually reduce or raise the amount of FDI is questionable.

3.5 Research Direction, Questions and Hypotheses

3.5.1 Research Direction

According to results of previous studies on FDI, there are some outstanding issues about FDI that have not been addressed. First, in terms of the relationship between FDI and EG, many studies focus on the two-way nexus between FDI and EG; most researchers did not study their long-term relationship. Secondly, the conclusions about some FDI determinants (trade openness, exchange rate and inflation) are inconsistent. Thirdly, studies identifying FDI determinants in terms of the investors' views in selecting investment locations are relatively new because of the limited number of studies. Hence, some new factors such as improved democracy (Hasan & Mahvash, 2015), higher education levels and lower delinquency rates (Escobar, 2013), and political stability and security (Castiglione et al., 2012) should be explored further. Fourthly, research topics on FDI in Vietnam are not unified. Generally, empirical studies on FDI determinants in Vietnam focus on the five different research topics: the relationship between FDI and EG; the FDI provincial competition; the policy effects on FDI; the law effects on FDI; and the FDI location selection. However, the topics were investigated separately. This study explores the five topics in a single study to provide cohesive conclusions about FDI in Vietnam. Lastly, there are differences in research areas and duration on the same topic. Though some empirical studies are based at the national level (e.g., Vietnam), others investigated at the regional or provincial level, which can generate inconsistent results. In addition, data collected during different time periods can produce different findings. Therefore, to fill the knowledge gaps in the literature, we investigate inward FDI in Vietnam using a data set at national, regional and provincial levels to:

(i) examine the bi-directional relationship between FDI and EG; and
(ii) analyse FDI determinants and identify determinants affecting the FDI location selection in terms of the investors' views.

3.5.2 Hypotheses Development

To fill the knowledge gaps about inward FDI in Vietnam, this study focuses on five research topics:

(1) The relationship between FDI and EG
(2) The provincial competition for FDI
(3) The effects of policies on FDI
(4) The effects of laws on FDI
(5) The FDI location selection

3.5.2.1 Relationship between FDI and EG

The relationship between FDI and EG has been documented by many scholars around the world. Many different approaches have been employed to assess the topic and studies have been conducted not only within individual nations, but also regionally among countries (Nguyen & Ho, 2013). Existing evidence shows that many conclusions are consistent but contradictions exist.

Based on the literature, the FDI and EG relationship can be divided to two types: a "one-way nexus" (including "FDI-to-EG" and "EG-to-FDI") and a "two-way nexus". The one-way nexus FDI-to-EG relationship is supported by Kinuthia and Murshed (2015) in their study of Malaysia; Hoang et al. (2010) for Vietnam; Srinivasan et al. (2010) for Myanmar; and Kornecki and Rhoades (2007) for Hungary, the Czech Republic, Poland, Slovakia and Slovenia. The EG-to-FDI relationship was studied by Kinuthia and Murshed (2015) for Kenya and Malaysia; Labes (2015) for the BRICS countries; Razmi and Behname (2012) for eight Islamic countries; Moudatsou and Kyrkilis (2011) for the EU, Singapore and the Philippines; Srinivasan et al. (2010) for Indonesia, the Philippines, Singapore and Thailand; and Thanyakhan (2008) for Thailand. However, Srinivasan et al. (2010) find no relationship between FDI and EG for Brunei Darussalam and the Laos People's Democratic Republic.

For the two-way nexus between FDI and EG, scholars have found a bi-directional relationship between FDI and EG for the 13 MENA countries (Omri & Kahouli, 2014), Vietnam (Nguyen & Ho, 2013; Nguyen, Ho, et al., 2012), Indonesia and Thailand (Moudatsou & Kyrkilis, 2011), Portugal (Andraz & Rodrigues, 2010), and Malaysia and Vietnam (Srinivasan et al., 2010). However, except for Andraz and Rodrigues (2010) and Srinivasan et al. (2010), they did not study the long-term relationship between FDI and EG. In addition, except for Nguyen and Ho (2013) and Nguyen, Ho, et al. (2012), who focussed on the two-way nexus between FDI and EG at provincial and regional levels, most studies were conducted at the national level.

Considering that China and Vietnam have a similar political and economic system, existing China-related studies can provide some useful information for understanding the potential relationship between FDI and EG and the effects of provincial (or regional) competition on the location of FDI in Vietnam. According to the results for China, at FDI's introduction, it has a positive impact on EG because it is believed that FDI is embedded with advanced technologies and knowledge, which shifts the host country's production frontier (Wen, 2013; Guo & Luo, 2009; Yao et al., 2006). However, along with the domestic economy's rapid development, it has been shown that FDI gradually played a less important role in promoting China's EG (Wei & Li, 2011). To the contrary, a positive effect of the high EG rate on FDI was commonly identified in China over the past three decades (Wei & Li, 2011; Li & Shen, 2008; Sun, 2002). Some evidence suggests that the spatial spill-over effect of FDI on EG is different among China's regions (Wen, 2013). This FDI spatial spill-over effect on EG is

significantly present in the Yangtze River Delta (YRD) and Pearl River Delta (PRD); the effect is positive in PRD-based provinces but negative in YRD-based provinces.

Hence, the relationship between FDI and EG is debatable for all 63[14] provinces and cities, in six regions and the whole of Vietnam. This gives rise to questions whether the link is strong, to what extent GDP affects FDI and how much FDI explains EG.

Therefore, the following relationships are hypothesized:

($H_{1.1}$) There is a strong long-term bi-directional link between FDI and EG in Vietnam;

($H_{1.2}$) FDI significantly, positively affects EG at the provincial, regional, and national levels in Vietnam; and

($H_{1.3}$) EG significantly, positively affects FDI attraction at the provincial, regional and national levels in Vietnam.

3.5.2.2 FDI Provincial Competition and the Effects of Policies

3.5.2.2.1 FDI Provincial Competition

The determinants of FDI that have pushed foreign investors to invest in a single country or location is an important question that has been studied by many researchers (see Table 3.2). These determinants have been considered FDI-attractive factors that make some regions more favourable than others in competing for limited funds from overseas. To identify the FDI-attractiveness or FDI-competitive determinants, some studies conducted empirical analyses at the national level (Hasan & Mahvash, 2015; Kinuthia & Murshed, 2015; Labes, 2015; Razmi & Behname, 2012; Thanyakhan, 2008; Haq, 2001) and others at sub-national levels (Escobar, 2013; Castiglione et al., 2012; Pradhan, 2012; Wei & Li, 2011; Li & Shen, 2008; Sun, 2002). In Vietnam, FDI competition at sub-national levels has been studied by different authors. Nguyen and Ho (2013), Nguyen, Ho, et al. (2012), Malesky (2010) and Nguyen and Nguyen (2007) use the PCI as a tool to evaluate and compare provinces' competitiveness for FDI flows and the relationship between economic governance (the main focus of the PCI) and FDI attraction (Malesky, 2010).

According to Malesky (2010, p. 2), FIEs "have strong interests in at least nine of the ten PCI sub-indices: 1) lower entry costs; 2) access to land; 3) transparency and equity of business information; 4) low informal charges; 5) less time wasted on bureaucratic compliance; 6) lack of bias toward the state sector; 7) a proactive and creative leadership; 8) well-trained labour;" 9) fair legal protection; and 10) PSD policies. The PSD sub-index is not only "specifically about intervention geared at private entrepreneurs, but also includes some indicators which affect FDI prospects as well, such as the

[14] From 2004 to 2007, the number of administrative units in Vietnam was 64 provinces and cities (Assembly, 2008b). In 2008, Ha Tay province merged with Ha Noi city, which reduced the number to 63 (GSO, 2016m).

number of locally-sponsored trade fairs and business match-making" (Malesky, 2010, p. 2). Hence, these sub-indices are expected to be associated with FDI.

However, different researchers have found different results on the relationship between the PCI and FDI attraction. Malesky (2010) finds a strong, positive correlation between the PCI and FDI flows in Vietnamese provinces and cities; Nguyen, Ho, et al. (2012) conclude that provinces or cities with better governance are not strongly associated with higher total registered capital of licensed inward FDI projects in the NC and SCC areas of Vietnam. Nguyen and Ho (2013) show there is sub-national competition in the 64[15] provinces to attract FDI, whereas Nguyen and Nguyen (2007) conclude that it did not seem to be a significant factor when considering some provinces and Vietnam's partner countries.

Therefore, the issue "How does PCI actually help all Vietnam's provinces attract more or less FDI" is valid. Based on the 10 PCI sub-indices, it is hypothesized that:

($H_{2.1}$) Provinces with better governance are strongly associated with registered FDI.

3.5.2.2.2 The Effects of Policies on FDI

As discussed at the beginning of the thesis, government IIP or institutional conditions have been used as subsidies that can affect FDI flows. Foreign investors make strategic decisions on where and how to set up their operations based on the institutional conditions (grants, tax preferences or holidays, free land or other inputs, and regulatory policy concessions) that vary not only among countries, but also within countries (Thomas, 2009).

Some Chinese studies investigated the effects of policies on attracting FDI among the country's provinces. At the provincial level, Sun (2002) finds that regional tax competition exists and taxation is an important factor affecting the spatial distribution of FDI but its role has weakened over time. The study by Li and Shen (2008) suggests that provincial competition strategies expanded from the pure tax price to government expenditure in China because of different levels of economic development. Wei and Li's (2011) results show that a better EG performance rather than tax incentives is likely to be more significant in attracting FDI to central and eastern China than to the relatively underdeveloped western region. According to Zhu, Zhang, and Jiang (2011), in neighbouring municipalities, environmental policy can be taken into consideration in competing for FDI and is compared with regions with a high level of FDI. The study shows that the effect of the "race to the bottom" of environmental policy may be higher in the regions with lower level of FDI.

[15] Nguyen and Ho's (2013) study is based on unbalanced data of 64 provinces and cities from 2000 to 2010 (Vietnam had 64 provinces and cities between 2004 and 2007).

In Vietnam, to increase their competitive ability to attract FDI, many provinces issued extra legal documents or IIPs granting extra incentives to investment projects, which can be named "IIP-based" competition. The three fence-breaking areas in which provinces make offers are budget regulations, land incentives, and income tax regulations (Vu et al., 2007).

However, studies about the effects of policies on FDI in Vietnam are limited and the results from the empirical studies are inconsistent. Provincial economic policies were identified as important factors in attracting FDI (Hoang & Goujon, 2014) and Vietnam made great efforts to regulate sub-national incentives to attract more FDI (Vu et al., 2009). However, based on a small survey of foreign firms, Vu (2007) reveals that provinces that adopted extra-legal incentives reduced the amount of FDI per capita they received in the year after the adoption of those incentives. Hence, the issue of whether IIP actually reduces or raises the amount of FDI is debatable.

The following relationship is hypothesized:

($H_{2.2}$) Provinces with higher fiscal incentives attract less FDI.

3.5.2.3 The Effects of Laws on FDI

The effect of laws and agreements on FDI is another critical issue. Historically, after the 1986 economic reforms, some important law and regulation milestones related to FDI in Vietnam were developed, e.g., the first FDI law in 1987, the BTA in 2000, the Unified Enterprise Law in 2005, the Common Investment Law in 2005, the WTO commitments in 2007, and the new Investment Law in 2014. Among them, the 2005 laws and the WTO membership in 2007 were considered the first outstanding national commitments to treat private and foreign investors alike in Vietnam.

A significant positive impact on inward FDI was found after Vietnam accessed the WTO (Nguyen, Zhang, et al., 2012; Pham, 2011). Further, the rule of law (the 2005 laws) positively contributed to attracting FDI to 14 provinces and cities of Vietnam (Nguyen, Zhang, et al., 2012). According to Nguyen, Zhang, et al. (2012, p. 214), the law factor exhibited "a more positive and stronger impact on FDI attraction of Vietnam than the WTO accession."

Although the positive effect of laws on FDI is consistent with most studies, the different studies were conducted in different research areas. For example, Pham (2011) studied the WTO's effects at the national level (Vietnam and 17 partner countries), whereas Nguyen, Zhang, et al. (2012) used data from 14 provinces and cities in the NCSCC areas of Vietnam to investigate the effect of laws on FDI. To evaluate the impact of laws on FDI, the authors divided the data into two groups: before and after Vietnam joined the WTO. In the first data group (before joining the WTO), the study period was 18 years (1990-2007) in Pham's (2011) study and 7 years (2001-2007) in Nguyen, Zhang, et al.'s (2012) study. In the second data group (after joining the WTO), the study time is limited (1 year, 2008, for

Pham's (2011) study and 3 years, 2008 to 2010, for Nguyen, Zhang, et al.'s (2012) study). There is a similar time problem in Nguyen and Ho's (2013) study even though they included all Vietnam's 64 provinces and cities.

International trade agreements include not only becoming members of WTO but also FTAs. To date, no empirical study has focused on the effect of Vietnam's FTA membership on FDI attraction to Vietnam. As a result, it is important to test and compare the effects of the laws on FDI in Vietnam with an extended study time (2000 – 2015) at the provincial level. The following relationships are hypothesized:

($H_{3.1}$) *There is a significant growth of FDI in Vietnam, especially in the first ranked provinces[16], following the release of the new law of investment and enterprise in 2005; and*

($H_{3.2}$) There is a significant growth of FDI in Vietnam, especially in the first ranked provinces, following Vietnam's WTO and FTA membership.

3.5.2.4 FDI Location Selection

Identifying the determinants in selecting investment locations from the investors' viewpoint is necessary for home countries to attract more FDI by improving their investment environment. However, the number of studies related to investors' decisions about where to locate capital is limited. In addition, different researchers identify different factors that have significant effects on choosing investment locations. Some identified factors are improved democracy (Hasan & Mahvash, 2015), higher education levels and lower delinquency rates (Escobar, 2013), and political stability and security (Castiglione et al., 2012).

Investors' subjective decisions in choosing the investment's location are important to the EG and development of host countries. However, few researchers (Hoang & Goujon, 2014; Vu et al., 2009; Nguyen & Nguyen, 2007) have focused on this topic for Vietnam and their results are inconsistent. Hoang and Goujon (2014, p. 103) find "a dominance of the regional trade platform FDI and regional agglomeration effects". Vu et al. (2009) investigated the determinants in selecting investment locations based on mining and quarrying industry data. The results do not show any factors impacting FDI projects' location in all industries at the provincial level in Vietnam. Using spatial econometric models to investigate the determinants of the FDI distribution at the Vietnam provincial level, Nguyen and Nguyen (2007) find the concentration of foreign investors in certain locations is because of the market, labour availability, infrastructure and the investors' nationalities.

[16] The first ranked provinces have extremely difficult socio-economic conditions and are listed as areas eligible for investment incentives (regulated by Appendix II promulgated together with the Government's Decree No. 118/2015/NĐ-CP dated 12/01/2015 on guidelines for some articles of the Law on Investment 2014 (Government, 2015)).

The following relationship is hypothesized:

($H_{4.1}$) *The geographical concentration of FDI exists in certain locations affected by the determinants of the FDI-inflow distribution in Vietnam.*

3.6 Conclusion

The literature review related to inward FDI shows gaps in the Vietnam context. These gaps include: (i) a lack of studies investigating the long-term two-way relationship between FDI and EG; (ii) inconsistent conclusions on FDI determinants (trade openness, exchange rate, and inflation); (iii) a limited number of studies exploring the determinants of investors' decisions about where to locate their capital; (iv) in Vietnam, the five different research topics (the relationship between FDI and EG, FDI provincial competition, the effects of policies on FDI, the effects of laws on FDI, and the FDI location selection) have not been investigated in a single study; and (v) differences in research areas and duration on those same topics have generated inconsistent findings for Vietnam.

To fill the gaps, the research directions that need to be addressed using a dataset at the national, regional, and provincial levels are: (i) examine the bi-directional relationship between FDI and EG in Vietnam; and (ii) analyse the FDI determinants as well as identifying the determinants affecting the FDI location selection from the investors' viewpoint. This study focuses on five research topics: the relationship between FDI and EG, FDI provincial competition, the effects of policies on FDI, the effects of laws on FDI, and the FDI location selection.

Chapter 4

Data and Methodology

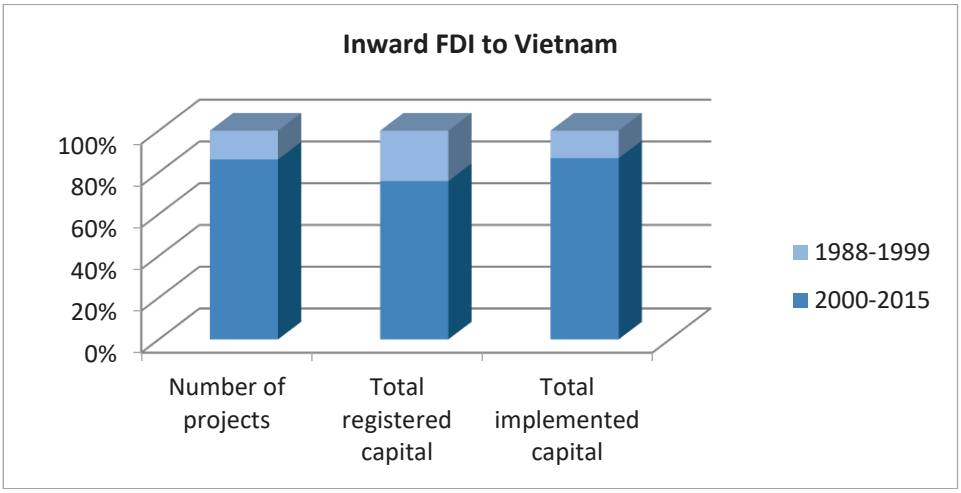
4.1 Introduction

This chapter describes the data and methodologies employed in the study. Section 4.2 details the choice of study period and research area. Section 4.3 describes the selection and construction of the dependent and independent variables. The data are presented in Section 4.4. Section 4.5 discusses the research methodologies including the cointegration, OLS and ECM approaches and the OLS estimators. Section 4.6 illustrates the empirical models employed to investigate the relationship between FDI and EG, FDI provincial competition, the effects of policies on FDI, the effects of laws on FDI, and the FDI location selection. Section 4.7 concludes the chapter.

4.2 Study Period and Area

4.2.1 Study Period

The study period is from 2000 to 2015. There are three reasons for choosing this period. First, most inward FDI flows into Vietnam were over that 16-year period (see Figure 4.1). Figure 4.1 shows the percentage of FDI projects during 1988-1999 (14.8%) and 2000-2015 (86.2%). Secondly, 75.85% of the total FDI registered capital and 86.83% of the total FDI implemented capital occurred during 2000-2015. Thirdly, data from before 2000 at the provincial level were not well developed and updated compared with the data at the national level.



Source: Data collected and computed from GSO (2016h) and GSO (2015b)

Figure 4.1 A Comparison of the Inward FDI to Vietnam for 1988-1999 and 2000-2015

4.2.2 Research Area

Vietnam comprises six regions from the North to South (GSO, 2016m). The north part comprises the Northern Midlands and Mountain Areas (NMMA) and the Red River Delta (RRD). The middle of the country includes the North Central and Central Coastal Areas (NCCCA), and the Central Highlands (CH). The two remaining areas in south Vietnam are the South East (SE) and the Mekong River Delta (MRD).

According to GSO (2016m), as at 31 December, 2015, there were 63 administrative units (five cities and 58 provinces) in Vietnam. Appendix Table B.1 lists Vietnam's administrative units at the provincial level by region. The NMMA (Region 1) is made up of 14 provinces, namely, Lai Chau, Dien Bien, Son La, Hoa Binh, Cao Bang, Lang Son, Bac Giang, Thai Nguyen, Bac Kan, Ha Giang, Tuyen Quang, Phu Tho, Lao Cai and Yen Bai. The RRD (Region 2) includes two cities (Ha Noi and Hai Phong) and nine provinces (Hai Duong, Hung Yen, Ninh Binh, Thai Binh, Ha Nam, Nam Dinh, Bac Ninh, Vinh Phuc and Quang Ninh). Region 3, NCCCA, includes one city (Da Nang) and 13 provinces (Thanh Hoa, Nghe An, Ha Tinh, Quang Binh, Quang Tri, Thua Thien Hue, Quang Nam, Quang Ngai, Binh Dinh, Phu Yen, Khanh Hoa, Ninh Thuan and Binh Thuan). Region 4, CH, has five provinces, Kon Tum, Gia Lai, Dak Lak, Dak Nong and Lam Dong. In the south, Region 5, SE, has one city (Ho Chi Minh city) and five provinces (Tay Ninh, Binh Phuoc, Binh Duong, Dong Nai and Ba Ria – Vung Tau). Region 6, MRD, has one city (Can Tho) and 12 provinces (Long An, Tien Giang, Ben Tre, Tra Vinh, Vinh Long, Dong Thap, An Giang, Kien Giang, Hau Giang, Soc Trang, Bac Lieu and Ca Mau).

However, the number of administrative units has changed over time. The number rose from 38 in 1976 to 44 in 1989, increased to 53 in 1991 and to 61 units in 1997 (VOER, 2017). In 2004, Can Tho city and Hau Giang province were established from Can Tho province, the old Lai Chau province was divided into new Lai Chau and Dien Bien, and old Dak Lak province was divided into new Dak Lak and Dak Nong (Assembly, 2008b). Therefore, the number of units increased to 64 in 2004. From 2008 onwards, because Ha Tay province merged with Ha Noi city, the total reduced to 63 units. As a result, data recorded at the provincial level also changed, resulting in no available data either for the new administrative units (Hau Giang, Dien Bien and Dak Nong) before establishment in 2004 or for the old administrative unit, Ha Tay, after it merged with Ha Noi city in 2008.

The study uses panel data at the provincial level from 2000 to 2015. However, as explained above, the number of provinces and cities increased from 61 units (2000-2003) to 64 units (2004-2008), but decreased then to 63 units (2008-2015). Therefore, if all 64 administrative units were included in the panel data, there will be missing data points. To minimise the number of missing data points at the provincial level, the data of 64 units are combined into the 60 cross-units listed in Table 4.1.

Table 4.1 The Vietnam Administrative Cross-Units Included in the Panel Data at the Provincial Level

No.	Cross-units	No.	Cross-units	No.	Cross-units
I	**Region 1. NMMA**	21	Thai Binh	41	Dak Lak[3]
1	Ha Giang	22	Ha Nam	42	Lam Dong
2	Cao Bang	23	Nam Dinh	**V**	**Region 5. SE**
3	Bac Kan	24	Ninh Binh	43	Binh Phuoc
4	Tuyen Quang	**III**	**Region 3. NCCCA**	44	Tay Ninh
5	Lao Cai	25	Thanh Hoa	45	Binh Duong
6	Yen Bai	26	Nghe An	46	Dong Nai
7	Thai Nguyen	27	Ha Tinh	47	Ba Ria - Vung Tau
8	Lang Son	28	Quang Binh	48	**Ho Chi Minh city**
9	Bac Giang	29	Quang Tri	**VI**	**Region 6. MRD**
10	Phu Tho	30	Thua Thien Hue	49	Long An
11	**Lai Chau[1]**	31	**Da Nang city**	50	Tien Giang
12	Son La	32	Quang Nam	51	Ben Tre
13	Hoa Binh	33	Quang Ngai	52	Tra Vinh
II	**Region 2. RRD**	34	Binh Dinh	53	Vinh Long
14	**Ha Noi city[2]**	35	Phu Yen	54	Dong Thap
15	Vinh Phuc	36	Khanh Hoa	55	An Giang
16	Bac Ninh	37	Ninh Thuan	56	Kien Giang
17	Quang Ninh	38	Binh Thuan	57	**Can Tho city[4]**
18	Hai Duong	**IV**	**Region 4. CH**	58	Soc Trang
19	**Hai Phong city**	39	Kon Tum	59	Bac Lieu
20	Hung Yen	40	Gia Lai	60	Ca Mau

Note: [1] Lai Chau province data include Dien Bien province's data
[2] Ha Noi city data include Ha Tay province's data
[3] Dak Lak province data include Dak Nong province's data
[4] Can Tho city data include Hau Giang province's data

Source: Information adapted from GSO (2016m)

4.3 Variable Selection and Construction

4.3.1 Dependent Variables

To investigate the research questions, two dependent variables (EG and FDI attraction) are employed in multivariate regression models.

4.3.1.1 Economic Growth

In previous FDI studies, GDP is widely used to represent EG. Previous studies (see Chapter 3) that employed GDP to investigate the linkage between EG and FDI include Nguyen, Ho, et al. (2012), Hoang et al. (2010), Srinivasan et al. (2010), Thanyakhan (2008) and Kornecki and Rhoades (2007).

GDP can be measured in three different ways: production (or output or value added), income, and expenditure (Pritzker, Arnold, & Moyer, 2015). In the production approach, GDP is the "sum of the

gross values added of all resident institutional units engaged in production (plus any taxes and minus any subsidies on products not included in the value of their outputs)" (OECD, 2002). The income approach estimates GDP by adding incomes that firms pay to households for operating activities (wages for labour, interest for capital, rent for land, and profits for entrepreneurship) (OECD, 2002). The expenditure approach measures GDP as the sum of personal consumption (C), business investment (I), government spending (G), and net exports (X) (Pritzker et al., 2015).

However, using GDP at the provincial level has some limitations. First, GDP counts all outputs generated within the borders of a country (Callen, 2012), not at the province nor city level. Second, if GDP is calculated for provinces that are administrative units within the country, it may result in variances between GDP at the provincial level and GDP of the whole economy. This is because a calculation overlap may occur if product parts are manufactured in different provinces or the product or parts are made in one province but exported from another province (VnExpress, 2014). Furthermore, according to the WB (2016b), in developing countries, GDP may not report a share of the agricultural output (e.g., rice) that is consumed within households or not exchanged for money but other things such as bread or sugar.

This study uses Retail Sales of Goods and Services (RS) to represent EG at the Vietnam provincial level. Mukherjee (2014) used RS to identify the relationship between growth in RS and FDI in India from 1975 to 2010. In Mukherjee's study, private final consumption is employed as a proxy for retail sales[17], which is an important component of GDP. Jude and Masca (2009) employed consumption to investigate the interdependence of FDI in Romania from 2000 to 2006. The results in that study show the impact of FDI on consumption indirectly affects EG.

RS can represent EG for the following reasons. First, RS measures consumer spending that is a component of GDP. According to the US Census Bureau (2008), RS is defined as finished goods and services sold to consumers at the end of the supply chain, generally without transformation, over a specified period. As discussed in the expenditure approach, the GDP calculation is based on the final goods and services purchased by individuals, businesses, governments, and foreigners (Pritzker et al., 2015). Hence, RS can reflect consumer spending patterns impacting the GDP of the economy. In other words, an increase or a decline in RS can be a positive or negative signal of EG, respectively.

[17] According to Mukherjee (2014), private final consumption includes household expenditure on durable and nondurable goods and services during a certain period. This shows the expenditure patterns of consumers in consumption goods, thus an increase or a decrease in the private final consumption directly relates to the increase or the decrease in retail sales.

Second, though GDP is calculated at the national level (VnExpress, 2014), RS can be used to measure the EG of regions, provinces or cities of one country. This is because RS calculates finished goods and services sold to retailers (US Census Bureau, 2008), which does not result in a calculation overlap.

Third, RS highly correlates with GDP in Vietnam based on data collected from GSO (2016r) and GSO (2016i). A correlation of 0.9974 (nearly 1) is found between RS and GDP in Vietnam from 1990 to 2015 (see Appendix Table B.2). Figure 4.2 shows that both RS and GDP have the same upward trend from 1990 to 2015.

In this study, RS (at current prices in billion VND) is used to represent EG at the regional and provincial levels because it overcomes the limitations of regional and provincial GDP data. GDP (at current prices in billion VND) is used to represent EG at the national level because of the wide use of GDP in previous studies related to FDI across countries or economies. Notations for the variables are $\mathbf{RS_{jt}}$, $\mathbf{RS_{it}}$, and $\mathbf{GDP_t}$, where ***t*** stands for years, ***j*** stands for regions of Vietnam, ***i*** stands for provinces or cities of Vietnam; the absence of a subscript (such as GDP_t) denotes national level data.

Source: Data collected from GSO (2016r) and GSO (2016i)

Figure 4.2 A Comparison of Retail Sales and GDP in Vietnam 1990-2015

4.3.1.2 Foreign Direct Investment

In terms of the dependent variable representing FDI attraction, two possible options are available: (i) the annual number of licensed inward FDI projects, and (ii) the total annual registered capital of licensed inward FDI projects (including the added capital of licensed projects of previous years). This study employs option (ii) because it represents FDI attraction from both current and new foreign investors, whereas option (i) measures only the number of new licensed FDI projects. Option (ii) is used to represent FDI attraction to Vietnam in previous studies such as Nguyen and Ho (2013), Nguyen, Ho, et al. (2012), and Nguyen and Nguyen (2007).

The total registered annual capital of licensed inward FDI projects (including the added capital of licensed projected of previous years) is also used as the dependent variable in the regression models to investigate the three remaining research questions related to FDI provincial competition, the effects of policies and laws on FDI, and FDI location selection.

Notations for the variable used to represent FDI attraction are $\mathbf{FDI_t}$, $\mathbf{FDI_{jt}}$, and $\mathbf{FDI_{it}}$, where ***FDI*** stands for the total registered capital of licensed inward FDI projects including added capital of licensed projects in previous years (in million USD).

4.3.2 Explanatory Variables

Based on the literature review of FDI determinants (see Chapter 3), the determinants are categorised into groups based on their features. In this study, five groups: human capital, economic, infrastructure, policy and law related, and provincial competition and institutional factors, are employed to investigate the four research questions. The demographic and human capital group includes three variables: population, labour force and education level. The economic group includes nine variables: open trade, exchange rate, inflation, incremental capital output ratio, income, state-owned investment, marketization, expenditure on science, technology and environment, and financial crisis. The infrastructure group is represented by four variables: good freight, patient beds, communication development and website quality. The policy and law related group is represented by five factors: introduction of new laws, participation in WTO, participation in FTAs, province ranking, and region ranking. The fifth group concerns provincial competition and institutional factors: investment incentive policies, provincial competitiveness index and its nine sub-indices, and country risk.

4.3.2.1 Demographic and Human Capital Factors

Population (POP), **Labour Force (LF)**, and **Education Level (EDU):** According to the literature, the human resource is an important FDI determinant or an absorptive capacity factor that optimises the utilization of FDI and generates the multiplier effect of FDI on EG (Kumari, 2014). Demographic and human capital variables such as labour force and education level, have positive effects on attracting FDI (Hasan & Mahvash, 2015; Kumari, 2014; Omri & Kahouli, 2014; Escobar, 2013; Zhao & Xiang, 2012; Huang & Chai, 2006; Sun, 2002). In this study, the demographic and human capital factors employed are the average population (POP) in thousands; the labour force at 15 years of age and above (LF) in thousands; and the education level (EDU) is the number of students in universities and colleges (STU) over POP (see Appendix Table B.3). Notations for the variables are: $\mathbf{POP_t}$, $\mathbf{POP_{jt}}$, $\mathbf{POP_{it}}$, $\mathbf{LF_t}$, $\mathbf{LF_{jt}}$, $\mathbf{LF_{it}}$, $\mathbf{EDU_t}$, $\mathbf{EDU_{jt}}$, and $\mathbf{EDU_{it}}$.

4.3.2.2 Economic Factors

Open Trade (OT), **Exchange Rate (ER)**, and **Inflation (CPI – Consumer Price Index)** are used as the first three economic factors to investigate their impact on FDI in Vietnam. Conclusions for FDI determinants of trade openness, exchange rate, and inflation in previous studies are mixed. Though trade openness exhibits a negative impact on FDI (Razmi & Behname, 2012), it positively affected FDI in the studies by Hasan and Mahvash (2015), Kinuthia and Murshed (2015), and Labes (2015). Exchange rate also impacts FDI both positively (Kinuthia & Murshed, 2015; Labes, 2015) and negatively (Kinuthia & Murshed, 2015; Haq, 2001). Hasan and Mahvash (2015) and Razmi and Behname (2012) show inflation rate and FDI exhibit a negative relationship, but the relationship is positive in Kinuthia and Murshed's (2015) study. Our study uses OT (in billion VND) computed as the sum of export and import values for Vietnam[18]; ER (in thousand VND per USD) is the VND-USD yearly average exchange rate; and CPI is annual average consumer price index representing inflation in Vietnam[19]. The notations for the three variables are $\mathbf{OT_t}$, $\mathbf{ER_t}$, $\mathbf{ER_{jt}}$, $\mathbf{ER_{it}}$, $\mathbf{CPI_t}$, $\mathbf{CPI_{jt}}$, and $\mathbf{CPI_{it}}$.

Incremental Capital Output Ratio (ICOR) measures the efficiency of the total capital invested in the development of an economy. This ratio represents the economy absorptive capacity including factors related to the economic climate (Kumari, 2014). ICOR is an aggregated indicator of the ratio of investment to growth, which equals 1 divided by the marginal product of capital or $ICOR_t = I_t/(GDP_t - GDP_{t-1})$, where I is the total capital invested in development of an economy and t is time (see Appendix Table A.5). ICOR data are the same at national, regional and provincial levels with the notations $\mathbf{ICOR_t}$, $\mathbf{ICOR_{jt}}$, and $\mathbf{ICOR_{it}}$.

Income (INC): According to Malesky (2010), FIEs have a strong interest in investing in countries with lower entry costs. One of these costs is the average wage or average income per capita. For example, Kinuthia and Murshed (2015) reveal that wages significantly, negatively affect FDI. Hence, another economic factor employed should be the monthly average income per capita. In this study, the monthly average income per employee in the state sector at current prices (INC) is employed as a general representative variable of labour cost. The notations for this variable are $\mathbf{INC_t}$, $\mathbf{INC_{jt}}$, and $\mathbf{INC_{it}}$.

State-owned investment (STATE) and **Marketization (MKT):** Castiglione et al. (2012) and Pradhan (2012) find that domestic investment is a positive determinant of FDI. Domestic investment includes investment activities of the state-owned and non-state-owned sectors. The level of marketization or sectorial development is also believed to play an important role in attracting FDI (Kumari, 2014; Zhao & Xiang, 2012; Huang & Chai, 2006; Sun, 2002). Therefore, the share of the state-owned investment

[18] OT data are unavailable at regional and provincial levels.
[19] ER and CPI data are the same at national, regional and provincial levels.

over the total investment (STATE) and the share of the non-state-owned investment over the total investment, Marketization (MKT), are employed as economic explanatory variables in this study at the national level with the notations $\mathbf{STATE_t}$ and $\mathbf{MKT_t}$, respectively.

Expenditure on Science, Technology and Environment (SCI): According to Haq (2001), research and development expenditure is a significant, positive determinant of FDI in the US. Hence, this study employs the share of that state budget expenditure on Science, Technology and Environment (SCI) to investigate its relationship with FDI in Vietnam from 2000 to 2015 (with the notation $\mathbf{SCI_t}$).

Financial Crisis (CRI): The world economy has faced financial crises affecting FDI flows. For Vietnam, the world financial crises in 1997 and 2008 significantly decreased the registered capital of licensed inward FDI projects (see Figure 1.3). Hence, financial crisis is employed as a dummy variable to address its effects on FDI in Vietnam. For the 2008 crisis, the dummy variable **CRI** is employed with CRI=1 after 2007, CRI=0 otherwise. The CRI data are the same at national, regional and provincial levels (with the notations $\mathbf{CRI_t}$, $\mathbf{CRI_{jt}}$, and $\mathbf{CRI_{it}}$).

4.3.2.3 Infrastructure Factors

Infrastructure development contributes to the absorptive capacity of the economy to stimulate FDI (Kumari, 2014). According to the literature, infrastructure development is a positive, significant determinant of FDI. Hasan and Mahvash (2015) show that infrastructure significantly supported FDI in Malaysia, the Philippines, Singapore, Thailand and Turkey from 1990 to 2012. Kinuthia and Murshed (2015) find that infrastructure development significantly determined FDI in Kenya between 1960 and 2009. Castiglione et al. (2012) find that infrastructure improvements positively affected FDI in 79 Russian regions from 1996 to 2001. Pradhan (2012) identifies power availability as a key determinant of FDI in 16 Indian states between 2001 and 2010. This study employs four variables, goods freight (FRE), patient beds (BED), communication development (COM), and website quality (WEB) to represent infrastructure development in Vietnam.

Goods Freight (FRE), **Patient Beds (BED)** and **Communication Development (COM):** The first three infrastructure variables are the volume of goods freight in thousand tonnes (FRE), the number of patient beds (BED), and the development of communication (COM), which is the number of telephone and internet subscribers (in thousands). FRE and BED are employed at national, regional and provincial levels. COM is used at the national level because of data limitation. Their notations are $\mathbf{FRE_t}$, $\mathbf{FRE_{jt}}$, $\mathbf{FRE_{it}}$, $\mathbf{BED_t}$, $\mathbf{BED_{jt}}$, $\mathbf{BED_{it}}$, and $\mathbf{COM_t}$.

Website Quality (WEB): The ability to access information by investors (the category variable) is based on the quality of official websites or portals of state bodies (provinces and cities) in Vietnam from 2000 to 2015. WEB is evaluated by five factors: i) language availability (includes more than one

language); ii) availability of law documents; iii) economic and social information (on an English page); iv) documents for investment registration (on an English page); v) online registration and support (on an English page). If all five factors are available, WEB=5; if four factors are available, WEB=4; if three factors are available, WEB=3; if two factors are available, WEB=2; if one factor is available, WEB=1; and if no factor is available, WEB=0. WEB was evaluated in 2011 and 2016. In 2011, the first Vietnam regulation on providing online information and public services on electronic information pages or portals of state bodies (Decree No. 43/2011/NĐ-CP of the Government) was promulgated. According to the Government (2011), these electronic portals provide official information on the internet in all fields governed by the state bodies. Therefore, the results of the first evaluation are used for 2000-2011 and the second evaluation is used for 2012-2015 (additional information on calculating WEB is provided in Appendix Tables B.4 and B.5). $\mathbf{WEB_{it}}$ is the notation for this variable.

4.3.2.4 Policy and Law Related Factors

Introduction of New Laws (LAW), and **Participation in World Trade Organization (WTO):** The effects of policies and laws on FDI are documented in previous studies (Hoang & Goujon, 2014; Nguyen & Ho, 2013; Nguyen, Zhang, et al., 2012; Pham, 2011; Vu et al., 2009). For example, Nguyen and Ho (2013) show that both introducing new laws and joining the WTO positively impact FDI. Therefore, this study employs two dummy variables namely LAW and WTO to indicate "Vietnam's new Investment and Enterprise Laws in 2005" (LAW = 1 for the period 2005-2015, LAW = 0 for the period 2000-2004) and "Vietnam joined WTO in 2007" (WTO = 1 for 2008-2015, WTO = 0 for 2000-2007), respectively. The two dummy variables LAW and WTO are employed to investigate the effects of policies and laws on FDI. Data are at the national, regional and provincial levels (with notations $\mathbf{LAW_t}$, $\mathbf{LAW_{jt}}$, $\mathbf{LAW_{it}}$, $\mathbf{WTO_t}$, $\mathbf{WTO_{jt}}$, and $\mathbf{WTO_{it}}$).

Free Trade Agreement (FTA): International trade agreements include not only becoming members of WTO but also Free Trade Agreements. Although Vietnam joined the AFTA in 1993, the ASEAN in 1995, and the APEC in 1998, the study period is from 2000 to 2015. Therefore, the impacts of joining the AFTA, ASEAN and APEC in the years prior to 2000 (outside the study period) could not be investigated using dummy variables. In order to reflect the policies and laws' effects on FDI, besides WTO, this study uses a category variable namely FTA or the number of Free Trade Agreements in which Vietnam is a member (signed and in effect). Vietnam has been a member of AFTA since 1993, the US - Vietnam BTA since 2001, the ASEAN - ACFTA since 2005, the ASEAN - AKFTA since 2007, the ASEAN - AJCEP since 2008, the Japan - Vietnam EPA since 2009, the ASEAN - India CECA and the ASEAN - ANZ FTA since 2010, the Chile - Vietnam FTA since 2012, and the Republic of Korea - Vietnam FTA since 2015. To take the effects of the above trade agreements into consideration, FTA is

constructed as a category variable based on data from ARIC (2016) (see Appendix Table B.6). Data are at the national, regional and provincial levels (with notations $\mathbf{FTA_t}$, $\mathbf{FTA_{jt}}$, and $\mathbf{FTA_{it}}$).

Province Ranking (PR, PR2): Based on Vietnam's investment laws, investors are encouraged to invest in provinces or cities under difficult and extremely difficult socio-economic conditions[20] to decrease the inequality of development and income among remote and mountainous provinces and urban cities, and among the six regions in the country. Hence, to investigate the impact of regulations on the investment environment at the provincial level in Vietnam, a variable, Province Ranking (PR), is constructed as follows; PR=2 if the province or city is on the list of areas under the **extremely difficult** socio-economic conditions, PR = 1 if the province or city is on the list of areas under the **difficult** socio-economic condition, and PR = 0 otherwise (see Appendix Table B.7). From 2000 to 2005, PR is based on Decree No. 24/2000/ND-CP (Government, 2000)[21]; from 2006 to 2015, PR is based on Decree No. 108/2006/ND-CP (Government, 2006)[22]. A dummy variable, PR2, is based on PR: PR2 = 1 if PR = 2, PR2 = 0 otherwise. Notations for these variables are $\mathbf{PR_{it}}$ and $\mathbf{PR2_{it}}$.

Region Ranking (RR, RR2): Region ranking (RR), is based on PR, which indicates the differences in investment conditions among the regions. Therefore, the Vietnam FDI-inflow distribution is investigated at both the provincial and regional levels. RR is based on PR as follows: RR = 2 if a region is under **extremely difficult** socio-economic conditions, which means that **all** provinces in the region are under the extremely difficult socio-economic conditions (PR = 2); RR = 0 if a region is **not** under extremely difficult and difficult socio-economic conditions, which means that the region has at least one province under neither extremely difficult nor difficult socio-economic conditions (PR = 0); RR = 1 otherwise. The dummy variable, RR2, is based on RR: RR2 = 1 if the socio-economic conditions of a region are extremely difficult (RR=2), 0 otherwise[23]. The notations for these variables are $\mathbf{RR_{jt}}$ and $\mathbf{RR2_{jt}}$. Ranking provinces and cities (PR and PR2) and ranking regions (RR and RR2) based on their socio-economic conditions are employed to investigate the different effects of FDI determinants in different areas in Vietnam.

[20] Provinces and cities in Vietnam are divided into areas under three socio-economic conditions: (1) *extremely difficult*, (2) *difficult*, and (3) *neither* extremely difficult *nor* difficult conditions.
[21] Information is adapted from Appendix I (a list of areas where investment is encouraged) of Decree No. 24/2000/ND-CP guiding the Law on Foreign Investment in Vietnam in 1996 and Law No. 18/2000/QH10 on Foreign Investment in Vietnam in 2000.
[22] Information is adapted from Appendix III (a list of areas where investment is encouraged) of Decree No. 108/2006/ND-CP guiding Law No. 59/2005/QH11 on Investment in 2005.
[23] RR2 = 0 if the socio-economic condition of a region is not extremely difficult (either RR=1 or RR=0).

4.3.2.5 Provincial Competition and Institutional Factors

Investment Incentive Policies (IIP) Index: According to the literature on the effects of policies on FDI, the IIP can affect FDI flows because foreign investors make strategic decisions on where and how to set up their operations using IIP (Thomas, 2009). In other words, the IIP (grants, tax preferences or holidays, free land or other inputs, and regulatory policy concessions) can be considered a competition factor ("IIP-based" competition) not only among countries but also among provinces and cities in a country. However, studies on IIP are limited because previous studies consider only tax incentives (Wei & Li, 2011; Li & Shen, 2008; Sun, 2002). In addition, the results of some empirical studies in Vietnam are inconsistent. For example, sub-national incentives attract more FDI in Vu et al.'s (2009) study, but Vu (2007) reveals that provinces that adopted extra-legal incentives, reduced the amount of FDI per capita they received in the year after adoption of those incentives.

Therefore, a provincial competition variable, the IIP index, which is a combination of free land, income tax and import tax exemption, is constructed based on the regulations and laws at the provincial level in Vietnam from 2000 to 2015. Table 4.2 summarises the regulations and laws related to free land, income tax and import tax exemption in Vietnam.

Table 4.2 The Regulations and Laws on IIP in Vietnam 2000-2015

Source	Regulations and laws	Date signed	Date in effect	Free land	Income tax	Import tax
Government (2000)	Decree No. 24/2000/ND-CP	31/07/2000	01/08/2000	x	x	x
Government (2005a)	Decree No. 142/2005/ND-CP	14/11/2005	29/11/2005	x		
Government (2010b)	Decree No. 121/2010/ND-CP	30/12/2010	01/03/2013	x		
Government (2014)	Decree No. 46/2014/ND-CP	15/05/2014	01/07/2014	x		
Assembly (2003)	Law No. 09/2003/QH11	17/06/2003	01/01/2004		x	
Government (2003)	Decree No. 164/2003/ND-CP	22/12/2003	06/01/2004		x	
Assembly (2008a)	Law No. 14/2008/QH12	03/06/2008	01/01/2009		x	
Assembly (2013)	Law No. 32/2013/QH13	19/06/2013	01/01/2014		x	
Government (2005b)	Decree No. 149/2005/ND-CP	08/12/2005	01/01/2006			x
Government (2010a)	Decree No. 87/2010/ND-CP	13/08/2010	01/10/2010			x

Note: x indicates that a regulation or law is used to evaluate IIP based on free land, income tax exemption, or import tax exemption.
Source: Information adapted from the references listed in the *Sources* column. Regulations of the Vietnamese Government related to land include Decree No. 24/2000/ND-CP (Government, 2000), Decree No. 142/2005/ND-CP (Government, 2005a), Decree No. 121/2010/ND-CP (Government, 2010b), and Decree No. 46/2014/ND-CP (Government, 2014).

Table 4.3 The Number of Years Applying for Free Land in Vietnam

PR	Decree No. 24/2000/ND-CP	Decree No. 142/2005/ND-CP	Decree No. 121/2010/ND-CP	Decree No. 46/2014/ND-CP
0_Normal	Not indicated	3	3	3
1_Difficult	Not indicated	11	15	15
2_Extremely difficult	Not indicated	15	15	Whole project life
Year begins	2000	2005	2013	2014
Year ends	2004	2012	2013	2015

Note: "Not indicated" means provinces or cities determine the number of years applying for the free land. However, in this study, "Not indicated" equals 0. In addition, according to Law of the Vietnam National Assembly No. 67/2014/QH13 dated 26/11/2014 on Investment (Assembly, 2014): (i) the operation duration of an investment project inside an economic zone or in areas under difficult and extremely difficult socio-economic conditions shall not exceed 70 years. Therefore, in this study, "Whole project life" equals 70 years.
Source: Information adapted from Government (2014), Government (2010b), Government (2005b), and Government (2000)

The income tax related regulations and laws are the Decree of the Government No. 24/2000/ND-CP (Government, 2000), the Law of the Vietnam National Assembly No. 09/2003/QH11 (Assembly, 2003), the Decree of the Government No. 164/2003/ND-CP (Government, 2003), the Law of the Vietnam National Assembly No. 14/2008/QH12 (Assembly, 2008a) and the Law of the Vietnam National Assembly No. 32/2013/QH13 (Assembly, 2013).

Table 4.4 The Number of Years Applying for Income Tax Exemption for Profits in Vietnam

PR	Decree No. 24/2000/ND-CP	Law no. 09/2003/QH11	Decree No. 164/2003/ND-CP	Law No. 14/2008/QH12	Law No. 32/2013/QH13
0_Normal	1	0	2	0	2
1_Difficult	2	0	3	2	2
2_Extremely difficult	4	4	4	4	4
Year begins	2000	2004	2004	2009	2014
Year ends	2003	2008	2008	2013	2015

Source: Information adapted from Assembly (2013), Assembly (2008a), Assembly (2003), Government (2003), and Government (2000)

The regulations of the Vietnam Government related to import tax are Decree No. 24/2000/ND-CP (Government, 2000), Decree No. 149/2005/ND-CP (Government, 2005b) and Decree No. 87/2010/ND-CP (Government, 2010a).

There are four steps to compute the IIP index. First, the PR variable is used as an indicator of provinces and cities. Second, the number of years applying for the free land (see Table 4.3), the number of years applying for income tax exemption on profit (see Table 4.4), and the number of years applying for the import tax exemption on inputs for production since operation are from the regulations and laws from 2000 to 2015 (see Table 4.5).

Table 4.5 The Number of Years Applying for Import Tax Exemption on Inputs for Production since Operating in Vietnam

PR	Decree No. 24/2000/ND-CP	Decree No. 149/2005/ND-CP	Decree No. 87/2010/ND-CP
0_Normal	0	0	0
1_Difficult	0	0	0
2_Extremely difficult	5	5	5
Year begins	2000	2006	2010
Year ends	2005	2009	2015

Source: Information adapted from Government (2010a), Government (2005b), and Government (2000)

Third, the data are standardised using equation (4.1)[24] because: (i) the number of years (absolute value) applying for the type of investment incentives or investment preferences (free land, income tax exemption, and import tax exemption) in provinces and cities with different rankings (PR) are different, and (ii) the three types of investment incentives have different scales in years. Therefore, we use the standardised equation (4.1) to convert the absolute values with three different time scales into relative values within the scales for each province or city before computing the aggregate IIP index.

$$u_{it}^{p} = \frac{U_{it}^{p}}{U_{iMax}^{p}} \quad (4.1)$$

Where:

p stands for the type of investment preference, such as free land, income tax exemption, and import tax exemption;

t stands for years from 2000 to 2015;

i stands for provinces or cities;

u_{it}^{p} is a relative value of the type of investment preference p of province or city *i* in year *t*;

U_{it}^{p} is an absolute value of the type of investment preference *p* of province or city *i* in year *t*; and

U_{iMax}^{p} is a maximum value of types of investment preference *p* of province or city *i* in 2000-2015.

Fourth, IIP is calculated using equation (4.2)[25] where $\boldsymbol{IIP_{it}}$ is a relative aggregate value for all types of investment preference of a province or city *i* in year *t*, and a^{p} is a coefficient of importance level applying to each type of investment preference *p* with $\sum a^{p} = 1$.

$$IIP_{it} = \sum\left(u_{it}^{p} \times a^{p}\right) \quad (4.2)$$

[24] The equation is based on a method in calculating synthesis efficiency of investment projects by Nguyen and Tu (2007).

[25] The equation is based on a method calculating synthesis efficiency of investment projects according to Nguyen and Tu (2007).

In this study, the coefficient a^p $(0 \leq \mathrm{a^p} \leq 1)$ indicates how important the impact of investment incentives is on the FDI location selection by investors. It is assumed that the coefficients of free land, income tax exemption and import tax exemption are based on the average rates of revenue from land and houses, revenue from FDI enterprises, and export and import duties over the State budget revenue final accounts in Vietnam from 2000 to 2015, respectively. According to GSO (2017c), during 2000-2015, on average, 23.75% of the State budget revenue included revenue from land and houses (7.65%), revenue from FDI enterprises (9.94%) and exports and import duties (6.17%). Therefore, the coefficients of free land, income tax and import tax exemption are 0.3, 0.4, and 0.3, respectively. Consequently, IIP_{it} ranges from 0 to 1.

Provincial Competitiveness Index (PCI): Another provincial competition factor that attracts FDI is the economic governance evaluated by the PCI that has been available since 2005 (VCCI, 2016a). The PCI is used to evaluate and compare the competitiveness of FDI flows and the relationship between economic governance and FDI attraction in Vietnam as in Nguyen and Ho (2013), Nguyen, Ho, et al. (2012), Malesky (2010), and Nguyen and Nguyen (2007). However, their findings are mixed. For example, Malesky (2010) shows a significant positive linkage between the PCI and FDI flows for provinces and cities in Vietnam. On the other hand, Nguyen, Ho, et al. (2012) and Nguyen and Nguyen (2007) conclude that the PCI was not a strong FDI determinant in Vietnam. Therefore, this study uses both the PCI and its sub-indices[26] from 2005 to 2015 to investigate the competition factors that attract FDI at the provincial level in Vietnam.

According to VCCI (2016b), the PCI represents Vietnam's business environment assessed by an annual business survey of economic governance quality in encouraging the development of the non-state sector at the provincial level. Computation of the PCI is based on three steps: collecting data from a business survey and secondary data, calculating and standardising the 10 sub-indices to a 10-point scale, and calibrating the PCI based on the 10 sub-indices with their weights (the PCI's maximum score is 100). VCCI (2016b) provides detailed information on the measurement and assessment of each sub-index of PCI across Vietnam's provinces and cities.

The higher the PCI score the better is the business environment. This implies a province or city has: 1) lower entry costs to start a business (entry costs); 2) easier access to land and better security for business premises (land access and security of tenure); 3) a more transparent business environment and more equitable business information (transparency and access to information); 4) less time required for bureaucratic procedures and inspections (time costs and regulatory compliance); 5) fewer informal charges; 6) less crowding of private activity by policy biases toward state, foreign, or connected firms (policy biases); 7) more proactive and creative provincial leadership in dealing with

[26] Nine of 10 sub-indices of PCI are employed in this study.

enterprise problems (proactivity); 8) higher quality and better developed business support services (business support); 9) better labour training policies (labour and training); and 10) fairer and more effective legal processes for dispute resolution (legal institutions).

Table 4.6 The Sub-Indices of the PCI

No.	Sub-index	Measure	Abbreviation	Note
1	Entry cost	The differences in entry cost to start a business	ENTRY	x
2	Land access and security of tenure	A firm's ability to access land and the security of tenure since acquiring the land	LAND	x
3	Transparency and access to information	A firm's ability to access proper planning and legal documents necessary to run the business, availability of those documents, predictable implementation of new policies and laws, and the business utility of provincial websites	ACCESS	x
4	Time and regulatory compliance costs	The time wasted on bureaucratic compliance and suspension of operations for inspections by local regulatory agencies	TIME	x
5	Informal charges	Differences in paying informal or extra fees for operating business and their expected outcomes	CHARGE	x
6	Policy bias	Bias in policies between private firms and state-owned, foreign, or connected enterprises	BIAS	
7	Proactivity of provincial leadership	Ability of provinces and cities to implement central policies, working under some unclear national regulations, and taking their own initiative for private sector development	PROACT	x
8	Business support	The effort of provinces and cities to provide services to support private business, such as trade promotion, regulation provision to enterprises, co-business matchmaking, industrial zone provision and technological support.	SUPPORT	x
9	Labour and training	Province efforts to promote vocational training and skills development for local industries, and assisting in local labour force placement.	LABOUR	x
10	Legal institutions	Confidence of firms in the local legal system; an effective mechanism to resolve disputes or appeal against corruption.	LEGAL	x

Note: "Policy bias" is a new sub-index not employed in this study because of unavailable data. "Business support" called "Private sector development services" is used in this study; x indicates the sub-indexes used in this study.
Source: VCCI (2016b)

Table 4.6 shows nine of the PCI sub-indices are employed in this study, entry costs (ENTRY), land access and security of tenure (LAND), transparency and access to information (ACCESS), time cost and regulatory compliance (TIME), informal charges (CHARGE), proactivity (PROACT), business support (SUPPORT), labour and training (LABOUR), and legal institutions (LEGAL). These indices are considered institutional factors at the Vietnam provincial level. Their notations are: $\mathbf{PCI}_{it}$, $\mathbf{ENTRY}_{it}$, $\mathbf{LAND}_{it}$, $\mathbf{ACCESS}_{it}$, $\mathbf{TIME}_{it}$, $\mathbf{CHARGE}_{it}$, $\mathbf{PROACT}_{it}$, $\mathbf{SUPPORT}_{it}$, $\mathbf{LABOUR}_{it}$, and $\mathbf{LEGAL}_{it}$.

Country Risk (CR) Index: Institutional factors such as improved democracy (Hasan & Mahvash, 2015), lower delinquency rates (Escobar, 2013) and political stability and security (Castiglione et al., 2012) determine investors' decisions where to locate capital. This study uses a political risk index that is

one of the three risk subcategories[27] in the International Country Risk Guide (ICRG) computed by the PRS Group to investigate the effects of institutional factors on FDI location in Vietnam. The political risk index consists of 12 components (see Table 4.7) measuring different dimensions of the political and business environment that enterprises face when operating in another country. The index is obtained annually from data in December reports. A variable, the CR index, is based on 10 of the 12 components. These 10 components are divided into six sub-indexes including voice and accountability (VA) (military in politics and democratic accountability), political stability and absence of violence (PV) (government stability, internal conflict, external conflict, and ethnic tensions), government effectiveness (GE) (bureaucratic quality), regulatory quality (RQ) (investment profile), rule of law (RL) (law and order), and control of corruption (CC) (corruption). Measures of VA, PV, GE, RQ, RL, and CC are available from PRS (2017).

Table 4.7 The Components of the Political Risk Index

No.	Component	Points	Sub-index	Abbreviation	Weight (%)	Note
1	Military in politics	6	1. Voice and Accountability	VA	12	x
2	Democratic accountability	6				
3	Government stability	12	2. Political Stability and Absence of Violence	PV	42	x
4	Internal conflict	12				
5	External conflict	12				
6	Ethnic tensions	6				
7	Bureaucratic quality	4	3. Government Effectiveness	GE	4	x
8	Investment profile	12	4. Regulatory Quality	RQ	12	x
9	Law and order	6	5. Rule of Law	RL	6	x
10	Corruption	6	6. Control of Corruption	CC	6	x
11	Socioeconomic conditions	12	7. Socioeconomic Conditions	SC	12	
12	Religious tensions	6	8. Religious Tensions	RT	6	
Total		**100**			**100**	

Note: x indicates that sub-indexes are used in this study.
Source: Information is collected from PRS (2017)

The CR index is calculated using equation (4.3):

$$CR = \frac{\sum(Point_s \times Weight_s)}{\sum(Weight_s)} \quad (4.3)$$

Where: *Point* = points for each sub-index scored by PRS (2017);
Weight = the percentage of each sub-index proposed by PRS (2017) (see Table 4.7); and
s = sub-indexes including VA, PV, GE, RQ, RL, and CC.

The risk levels of the CR index are similar to the risk levels of its sub-indices determined by PRS (2017). According to PRS (2017), the risk levels range from Very high (<50%), through High (50%-

[27] The ICRG includes three subcategories of risk: political, financial, and economic (PRS, 2017).

60%), Moderate (60%-70%), and Low (70%-80%), to Very low (80%-100%). Appendix Table B.8 shows the construction of the CR index. The CR index is the same at the national, regional and provincial levels (with the notations $\mathbf{CR_t}$, $\mathbf{CR_{jt}}$, and $\mathbf{CR_{it}}$).

In summary, 38 variables are used in this study (see Appendix Table B.9). FDI, GDP, and RS are used as the dependent and independent variables in different regression models. For example, FDI is the dependent one in Model 2 and independent in Model 3, whereas RS is independent in Model 2 and dependent in Model 3 (see Section 4.6). The independent variables are the three human capital factors (POP, LF and EDU), nine economic factors (OT, ER, CPI, ICOR, INC, STATE, MKT, SCI and CRI), four infrastructure factors (FRE, BED, COM, and WEB), seven policy and law related factors (FTA, WTO, LAW, PR, PR2, RR, and RR2), and 12 provincial competition and institutional factors (IIP; PCI and its sub-indices including ENTRY, LAND, ACCESS, TIME, CHARGE, PROACT, SUPPORT, LABOUR, and LEGAL; and CR).

The number of variables differs at the three different levels (see Appendix Table B.9):

(i) At the provincial level: 30 variables including FDI, RS, POP, LF, EDU, ER, CPI, ICOR, INC, CRI, FRE, BED, WEB, LAW, WTO, FTA, PR, PR2, IIP, PCI, ENTRY, LAND, ACCESS, TIME, CHARGE, PROACT, SUPPORT, LABOUR, LEGAL, and CR.

(ii) At the regional level: 18 variables including FDI, RS, POP, LF, EDU, ER, CPI, ICOR, INC, CRI, FRE, BED, LAW, WTO, FTA, RR, RR2, and CR.

(iii) At the national level: 21 variables including FDI, GDP, POP, LF, EDU, OT, ER, CPI, ICOR, INC, STATE, MKT, SCI, CRI, FRE, BED, COM, LAW, WTO, FTA, and CR.

4.4 Data

4.4.1 Data Levels

In this study, data are grouped by provincial, regional, and national level. At the provincial and regional levels, two annual panel data sets of (i) the provinces and cities; and (ii) the regions in Vietnam (see Table 4.1) are used, respectively, from 2000 to 2015.

At the national level, the time series data are from 1990 to 2015. Expanding the study time from 2000-2015 (a duration of 16 years) to 1990-2015 (a duration of 26 years) enables me to evaluate the long-term relationship between FDI and EG. To examine the nexus in the long run, this study works with five variables, FDI, GDP, OT, ER and POP (see Appendix Table B.10).

4.4.2 Data Source

The data used in this study are from the GSO of Vietnam, the FXTOP website (FXTOP, 2017), the PRS Group, and the VCCI. Appendix Table B.11 gives the definitions, units, and data sources in detail. FDI, GDP, RS, LF, POP, OT, CPI, MKT, INC, SCI, FRE, COM, and BED are from the GSO, and EDU, ICOR, CRI, WEB, FTA, WTO, LAW, PR, PR2, RR, RR2, IIP, and CR are computed by the author. The six political factors (VA, PV, GE, RQ, RL, and CC) are obtained from the PRS Group (PRS, 2017). The ER information is obtained from the FXTOP website (FXTOP, 2017). PCI, ENTRY, LAND, ACCESS, TIME, CHARGE, PROACT, SUPPORT, LABOUR, and LEGAL are obtained from the PCI website (VCCI, 2016a).

4.5 Methodology

The four research questions and hypotheses are:

Research question 1 (what is the relationship between FDI and EG in the provinces and cities of Vietnam?). The hypotheses are:

$H_{1.1}$ - there is a strong long-term bi-directional link between FDI and EG in Vietnam;

$H_{1.2}$ - FDI significantly, positively affects EG at the provincial, regional, and national levels in Vietnam; and

$H_{1.3}$ - EG significantly, positively affects FDI attraction at the provincial, regional and national levels in Vietnam.

Research question 2 (how does PCI-based and IIP-based competition affect FDI at the provincial level in Vietnam?). The hypotheses are:

$H_{2.1}$ - provinces with better governance are strongly associated with registered FDI; and

$H_{2.2}$ - provinces offering higher fiscal incentives attract less FDI.

Research question 3 (does the rule of law matter in attracting FDI to Vietnam?). The hypotheses are:

$H_{3.1}$ - there is a significant growth of FDI in Vietnam, especially in the first ranked provinces, following the release of the new law of investment and enterprise in 2005; and

$H_{3.2}$ - there is a significant growth of FDI in Vietnam, especially in the first ranked provinces, following Vietnam's WTO and FTA membership.

Research question 4 (is there any geographical concentration of FDI in Vietnam?). The hypothesis is:

$H_{4.1}$ - the geographical concentration of FDI exists in certain locations affected by the determinants of the FDI-inflow distribution in Vietnam.

To test $H_{1.1}$ (the long-term bi-directional relationship between FDI and EG), I apply a procedure of three steps: (i) the long-term relationship between FDI and EG is evaluated using cointegration tests;

(ii) the relationship is re-evaluated using the OLS estimator; and (iii) the long-term relationship, its existence and the direction of causality between FDI and GDP are evaluated using the ECM method. This procedure is called a ***cointegration – OLS – ECM approach*** or *a* ***three-step approach***.

The OLS estimator is applied to test $H_{1.2}$ and $H_{1.3}$ on the relationship between FDI and EG (research question 1), $H_{2.1}$ and $H_{2.2}$ on the FDI provincial competition and effects of policies (research question 2), $H_{3.1}$ and $H_{3.2}$ on the effects of laws on FDI (research question 3), and $H_{4.1}$ on the geographical concentration of FDI in Vietnam (research question 4). This ***one-step approach*** uses the OLS estimation procedure.

4.5.1 The Cointegration – OLS – ECM Approach

To investigate the long-term bi-directional link between FDI and EG in Vietnam ($H_{1.1}$), this study employs the cointegration – OLS – ECM or three-step approach of Li, Kuang, Huang, and Zhang (2013), Moudatsou and Kyrkilis (2011) and Srinivasan et al. (2010) at the provincial and national levels. However, data at the provincial (panel data) and national (time-series data) levels are different, which requires different approaches. Therefore, the cointegration – OLS – ECM approach is applied to evaluate the nexus between FDI and EG at the provincial and national levels differently as follows.

4.5.1.1 Cointegration – OLS – ECM Approach at the Provincial Level

First, three types of panel co-integrated test methods, Pedroni (2004), Kao (1999) and Johansen-Fisher (Maddala & Wu, 1999), are used to evaluate the long-term relationship between FDI and EG. Second, the relationship is re-evaluated using the OLS estimator. Finally, the Panel Error Correction Model (PECM) is also used to evaluate not only the long-term relationship but also the existence and the direction of causality between FDI and EG at the provincial level.

Step 1 - Evaluate the long-term relationship between FDI and EG: This step comprises: (i) examine the stationarity of the panel data and then (ii) examine the long-term relationship between FDI and EG (the panel cointegration test: the Pedroni, Kao and Johansen-Fisher tests).

Testing the stationarity of the panel data ensures the effectiveness of the models. To test the stationarity of panel data, various unit root tests are available such as the Breitung (Breitung & Das, 2005; Breitung, 2000), Im, Pesaran and Shin (2003), Levin, Lin and Chu (2002), Fisher-ADF (augmented Dickey–Fuller) (Choi, 2001; Maddala & Wu, 1999), and Harris–Tzavalis (1999) tests. Among them, only the Im, Pesaran and Shin (IPS) test and the Fisher-ADF test do not require a strongly balanced panel dataset (each panel has the same number of observations and there are no

missing points in any panel series). In this study, the panel data consisting of 63 provinces and cities are not strongly balanced, therefore the IPS and Fisher-ADF tests are suitable to test the stationarity.

In addition, the IPS and Fisher-ADF tests allow for panel-specific autoregressive parameters (or consider panel heterogeneity), while the others assume that all panels have the same parameter (or consider them as homogeneous panels) (Li et al., 2013; Breitung & Pesaran, 2005). With the assumption that different provinces and cities of Vietnam may have individual characteristics such as culture and geography, the IPS and Fisher-ADF tests enable us to consider panel heterogeneity.

However, to ensure that our study can cover a reverse case (homogeneous panel data), employing one of the other unit root tests is necessary. Levin, Lin and Chu (LLC) (2002) recommend using their test if the panel size is moderate (between 10 and 250 panels and 25 to 250 observations per panel). Based on the recommendation of LLC, the size of panel dataset in our study is moderate, and therefore the LLC test is suitable. The Harris–Tzavalis (1999) test is not employed because it assumes that the number of time periods, T, is fixed and the number of panels, N, tends to infinity. However, this is not the case in our study as it is more likely to be able to add more years of data (unfixed T) rather than add more than 63 provinces and cities in Vietnam (fixed N). The fixed N also fails to employ the Breitung (Breitung & Das, 2005; Breitung, 2000) test because it uses sequential limit theory, that is T goes to infinity ('large' T), and then N goes to infinity.

Choi (2001) develops the Fisher unit root test (Maddala & Wu, 1999) using four methods, such as inverse χ^2, inverse-normal, inverse-logit transformation of p-values, and a modification of the inverse χ^2 transformation. When T is finite, the inverse χ^2 test is applicable (Choi, 2001). When T tends to infinite, for very large N (N is much greater than 100), Choi (2001) proposes the modified inverse χ^2 test. The inverse-normal and inverse-logit transformation use the sequential limit theory and are applied for finite or infinite N. Also, the Fisher-type tests (Choi, 2001) are appropriate to examine the stationarity of panel data when the time dimension of the sample (T) differs from panel to panel (To, Ha, Nguyen & Vo, 2019). In our study, the panel dataset consists of 60 panels (N=60) with the finite T. In addition, T is the same for all provinces and cities in our study. Therefore, the inverse χ^2 is applicable.

The above justification leads to using three panel unit root tests, the LLC test (Levin et al., 2002), the IPS test (Im et al., 2003), and the Fisher-ADF (augmented Dickey–Fuller) test (Maddala & Wu, 1999), to test the stationarity of the panel data at the provincial level in Vietnam. If variables or series are non-stationary at level and stationary after differenced (stationary at the first order), they are co-integrated (Granger, 1981). This means the series might have relationships in the long term. To examine whether there are any long-term relations among the co-integrated variables, the next step

uses a cointegration test for the panel data of 60 provinces and cities in Vietnam. The long-term nexus between FDI and EG is examined using three types of panel cointegration tests, the Pedroni (Pedroni, 2004), Kao (Kao, 1999), and Johansen-Fisher (Maddala & Wu, 1999) cointegration tests (the Pedroni, Kao, and Johansen-Fisher tests hereafter).

Step 2 - Re-evaluate the relationship between FDI and EG using the OLS estimator: Analysis of the long-run cointegrating relationships using panel data is supported by the residual-based panel Fully Modified OLS (FMOLS) estimators (Mark & Sul, 2003; Pedroni, 2001, 2000; Kao & Chiang, 2000; Phillips & Moon, 1999). The Panel FMOLS estimators can result in asymptotically unbiased, normally distributed coefficient estimates in cointegrating regressions.

Employing the panel FMOLS estimators can minimize the shortcomings of the OLS estimation known as the static OLS (SOLS). According to Hamilton (1994), the estimates' asymptotic distribution is an outstanding shortcoming of SOLS. This asymptotic distribution is bias, asymmetry, and non-Gaussian. If a long-term correlation between errors of a cointegrating equation and innovations of regressors, and cross-correlation between the errors and regressors exists, a SOLS's asymptotic distribution can arise. If the regressors X_t are strictly exogenous, the bias, asymmetry, and dependence on non-scalar nuisance parameters disappear, then the estimator of SOLS follows a fully efficient asymptotic Gaussian mixture distribution that allows a standard Wald test using conventional limiting distributions χ^2. To minimize the strictly exogenous X_t case, the Panel FMOLS cointegration regressions allow data transformation or cointegrating equation specification modifications. By employing a semi-parametric correction as an estimator (Phillips and Hansen, 1990), the long-term correlation problems between the errors and the innovations are eliminated. This results in an asymptotic unbiased FMOLS estimator, which has full efficient mixture of normal asymptotes and allows for the standard Wald test using asymptotic Chi-square χ^2 statistical inference.

Phillips and Moon (1999), Pedroni (2000), and Kao and Chiang (2000) offer extensions of the Phillips and Hansen (1990) FMOLS estimator to panel settings. Pedroni (2000) and Kao and Chiang (2000) describe feasible pooled FMOLS estimators for heterogeneous cointegrated panels where the long-run variances differ across cross-sections. Both panel FMOLS and Dynamic OLS (DOLS) estimators account for potential endogeneity and serial correlation, thus they are asymptotically unbiased and normally distributed. Thus, they do not require exogeneity assumptions. The FMOLS is a non-parametric approach, while the DOLS is a parametric approach using lags and leads. Therefore, the degrees of freedom decrease in the DOLS estimators, which is not preferred (To, Ha, Nguyen, & Vo, 2019). In addition, the FMOLS estimator outperforms the DOLS estimator as variables are stationary in different levels (Al-mulali, Fereidouni, Lee, & Sab, 2013). The DOLS estimator can account for forms of cross-sectional dependence as it allows time-demeaning data. According to Baltagi (2008),

cross-sectional dependence is a problem in macro panel with long time series (T is over 20-30 years) and not a big problem in micro panels (few T and large N). Based on the Baltagi's (2008) discussion, the panel data used in our study is not a macro panel (as T equals 16 years). Therefore, the cross-sectional dependence may not be a great issue in our study.

Step 3 - Investigate the causality direction between FDI and EG: The Granger Representation Theorem (Granger, 1988) shows that if the variables are co-integrated, at least one direction of their causal nexus must exist. Therefore, the Granger Causality test (the Panel ECM) is employed to investigate the causality direction between FDI and EG. Basically, if non-stationary variables are cointegrated, a Vector Error Correction (VEC) model known as a restricted Vector Autoregression (VAR) can be used because its cointegration correlation (cointegration term) is built into its specifications. This can restrict a convergence of endogenous regressors to their cointegrating relations in the long-term period as well as allow short-term dynamic adjustments. The cointegration term is also named the error correction term because a deviation in the long-run equilibrium is gradually modified by partial short-run adjustments. If the null hypotheses, i.e., the coefficients of panel error correction terms *ecm(fdi)* and *ecm(eg)* are greater than or equal to zero are rejected, it implies that FDI is Granger causal for EG and EG is Granger causal for FDI over the long run.

4.5.1.2 Cointegration – OLS – ECM Approach at the National Level

At the national level, the relationship between FDI and EG is evaluated using the cointegration – OLS – ECM approach: step 1 - evaluate the long-term relationship between FDI and EG; step 2 - re-evaluate the relationship between FDI and EG using the OLS estimator; and step 3 - investigate the causality direction between FDI and EG.

The rationale of using the cointegration – OLS – ECM approach to examine the FDI and EG nexus at the national level is the same at the provincial level. However, there are some differences because of the time-series data. In step 1, to test the stationarity of the time-series data, there are available unit root tests such as the ADF (Dickey & Fuller, 1979), Phillips-Perron (PP) (Phillips & Perron, 1988), Kwiatkowski-Phillips-Schmidt-Shin (KPSS) (Kwiatkowski, Phillips, Schmidt, & Shin, 1992), Dickey-Fuller Generalized Least Squares (DF-GLS) detrending (Elliott, Rothenberg, & Stock, 1996), the Elliot-Rothenberg-Stock (ERS) (Elliott et al., 1996), and Ng and Perron (NP) (Ng and Perron, 2001) tests. The ADF test is commonly used in previous studies such as Valera, Holmes, and Hassan (2017), Moudatsou and Kyrkilis (2011), Rao and Hassan (2011), and Srinivasan et al. (2010). In addition to the ADF test, the PP test is employed in Valera et al. (2017) and Srinivasan et al. (2010), and the DF-GLS test is used in Valera et al. (2017) and Rao and Hassan (2011). Therefore, the ADF, PP, and DF-GLS unit root tests with the nonstationary null are employed for time-series data at the national level in stead of the LLC, IPS and Fisher-ADF tests for panel data at the provincial level in our study. After

using the unit root tests, the long-term nexus between FDI and EG in Vietnam is examined using the Johansen cointegration test (Johansen, 1995, 1991) for time-series data instead of the Pedroni, Kao, and Johansen-Fisher tests for panel data. Although there are other two cointegration tests by Engle and Granger (1987) and Engle and Yoo (1987), a problem of these two tests is that they can deal with only one cointegrating relationship. The Johansen cointegration test (Johansen, 1995, 1991) is useful to cases having more than one cointegrating relationships because it allows the determination of up to r linearly independent cointegrating vectors ($r \leq g-1$, where g is the number of variables tested for cointegration).

In step 2, cointegrating regressions are re-estimated using the FMOLS estimator (Phillips & Hansen, 1990) at the national level instead of the Panel FMOLS estimator at the provincial level to re-evaluate the relationship between FDI and EG. In step 3, instead of the Panel VEC models used for the panel data, the VEC models are employed to identify the causality direction between FDI and EG for the time-series data at the national level. If the null hypotheses, i.e., the coefficients of *ecm*(*fdi*) and *ecm*(*eg*) are greater than or equal to zero are rejected, this indicates that a long-run nexus exists from the independent variable to the dependent variable.

4.5.2 OLS Estimation Procedure

The OLS estimation procedure, or one-step approach, is used to examine the rest of research question 1 ($H_{1.2}$ and $H_{1.3}$ on the relationship between FDI and EG), research question 2 (the FDI provincial competition and the effects of policies), research question 3 (the effects of laws on FDI), and research question 4 (the geographical concentration of FDI in Vietnam). To take individual characteristics of different groups or cross-sections into account, the panel OLS estimation supported by the Hausman test (Hausman, 1978) is used to test whether a fixed or random effect model is appropriate to estimate the panel data regression equations. The fixed effect model is appropriate with differences in intercepts across groups or times. Differences in error variances are explored using the random effect model. FDI-related studies employ the Hausman test (Hausman, 1978) to select appropriate effects for regression models. For example, the Hausman test recommended the use of the fixed effect model in Hasan and Mahvash (2015) and Nguyen and Ho (2013), and the random effect model in Labes (2015) and Razmi and Behname (2012). The Hausman test's the null hypothesis that the random effects model is preferred. If the differences across groups (between-entity errors) are correlated with regressors, the null hypothesis is rejected.

In conclusion, the cointegration – OLS – ECM approach is used to investigate the long-run nexus between FDI and EG ($H_{1.1}$ – research question 1) at provincial and national levels. The OLS estimation procedure supported by the Hausman test is used to examine the FDI and EG relationship ($H_{1.2}$ and $H_{1.3}$ - research question 1), the FDI provincial competition and effects of policies (research question

2), the effects of laws on FDI (research question 3), and the geographical concentration of FDI in Vietnam (research question 4).

4.6 Empirical Models

This section provides the empirical models to investigate the relationship between FDI and EG, the FDI provincial competition, the effects of policies and the effects of laws on FDI, and FDI location selection in Vietnam.

4.6.1 The Relationship between FDI and EG

This section describes the empirical models used to answer research question 1 (What is the relationship between FDI and EG in the provinces and cities of Vietnam?).

4.6.1.1 Hypothesis 1.1

To test $H_{1.1}$ *(there is a strong long-term bi-directional link between FDI and EG in Vietnam)*, the cointegration – OLS – ECM approach is applied at the provincial and national levels.

Provincial level: the cointegration – OLS – ECM approach is employed for the panel data using FDI, EG, ER, EDU, POP, and INC from 2000 to 2015. RS represents EG in the regression models at the provincial level. In the first step, the unit root tests (the LLC, the IPS and Fisher-ADF tests) are conducted and then the long-term nexus between FDI and EG in Vietnam is examined using three types of panel cointegration test (the Pedroni, Kao, and Johansen-Fisher tests) based on Model 1 (see Table 4.8).

Table 4.8 Models to Investigate the Long-run Relationship between FDI and EG at the Provincial Level

Test	Model number	Model
Panel cointegration tests	**Model 1**	Series: FDI, EG, ER, EDU, POP, INC
Cointegrating Regression: FMOLS	**Model 2**	$FDI_{it} = f(EG_{it}, ER_{it}, EDU_{it})$
	Model 3	$EG_{it} = f(FDI_{it}, ER_{it}, INC_{it}, POP_{it})$
VECM	**Model 4**	$\Delta FDI_{it} = f(FDI_{i(t-k)}, EG_{i(t-l)})$
	Model 5	$\Delta FDI_{it} = f(FDI_{i(t-k)}, EG_{i(t-l)}, ER_{it}, EDU_{it})$
	Model 6	$\Delta EG_{it} = f(EG_{i(t-l)}, FDI_{i(t-k)})$
	Model 7	$\Delta EG_{it} = f(EG_{i(t-l)}, FDI_{i(t-k)}, ER_{it}, INC_{it}, POP_{it})$

Note: i stands for provinces, ***t*** stands for years, $\boldsymbol{k}$ and $\boldsymbol{l}$ are lag orders; FDI is FDI registered capital, EG is Economic Growth represented by Retail Sales (RS), ER is Exchange Rate, EDU is education level, POP is average population, and INC is monthly average income (definitions and sources of variables used are presented in Appendix Table B.11).

The Pedroni (Engle-Granger based) cointegration test (Pedroni, 2004) is based on an investigation of the error terms of a regression performed employing variables in order one $I(1)$. It allows for heterogeneous intercepts and trend coefficients across cross-sections. If the variables are

cointegrated, the residuals should be $I(0)$, otherwise $I(1)$. The null hypothesis of no cointegration, H_0: all of the individuals i of the panel are not cointegrated (the residuals e_{it} will be $I(1)$), is tested by conducting the auxiliary regression for each cross-section.

The *Kao cointegration test* is based on the Engle and Granger (1987) study that specifies the cross-section specific intercepts and homogeneous coefficients on first-stage regressors. Kao (1999) uses the Dickey-Fuller (DF) test and an ADF test to test the null hypothesis of no cointegration.

The *Johansen-Fisher cointegration test* (Fisher, 1932) uses the combined test results of individual independent tests. Maddala and Wu (1999) use the Fisher test to test for cointegration in panel data by combining cross-section individual tests to obtain a statistic parameter for the full panel. To combine p-values, the $\boldsymbol{\chi^2}$ test statistic is employed to account for correlations among the test statistics of the individual cross-sections. The $\boldsymbol{\chi^2}$ value is based on *p-value*s for Johansen's cointegration trace test and maximum eigenvalue test (MacKinnon, Haug, & Michelis, 1999). The idea behind this test is to break up the null hypothesis H_0 of no cointegration into a set of sub-hypotheses H_{0i} of no cointegration in $\boldsymbol{i}$ cross-sections. The H_0 of no cointegration is rejected if and only if any of its component H_{0i} of no cointegration tests in $\boldsymbol{i}$ cross-sections is rejected.

In the second step, the bi-directional link between FDI and EG is examined using the panel FMOLS cointegration regressions for the two models: $FDI = f(EG, ER, EDU)$ and $EG = f(FDI, ER, INC, POP)$ (see Models 2 and 3, Table 4.8).

In the third step, four Panel VEC models are used to identify the existence and the direction of any causality between FDI and EG at the provincial level. The coefficient of ecm(FDI) is examined using Model 4 with FDI (as the dependent variable) and EG only, and then it is tested using Model 5 with other two variables namely ER and EDU. Similarly, Model 6 is used to evaluate the coefficient of ecm(EG) with EG (as the dependent variable) and FDI only; Model 7 includes the other three variables namely ER, INC and POP (see Table 4.8).

The estimated Panel ECM takes the following form:

$$\Delta FDI_{it} = \alpha_0 + \varphi ECT_{i(t-1)} + \sum \alpha_{1k} \Delta FDI_{i(t-k)} + \sum \alpha_{2l} \Delta EG_{i(t-l)} + \gamma_m X_{mit} + \varepsilon 1_{it} \qquad (4.4)$$

$$\Delta EG_{it} = \beta_0 + \omega ECT_{i(t-1)} + \sum \beta_{1l} \Delta EG_{i(t-l)} + \sum \beta_{2k} \Delta FDI_{i(t-k)} + \delta_n X_{nit} + \varepsilon 2_{it} \qquad (4.5)$$

where Δ is the difference operator, $ECT_{i(t-1)}$ is the error correction term (*ecm(FDI)* and *ecm(EG)*), which shows the long-run causalities from regressors to dependent variables, φ and ω are coefficients of the ECT, α_{2l} and β_{2k} are coefficients, respectively showing the short-run causalities of EG on FDI and FDI on EG, $\varepsilon 1_{it}$ and $\varepsilon 2_{it}$ are the white noise error terms, *i* stands for provinces, *t*

stands for years, k and l are lag orders, γ and δ show the short-run causalities from m and n independent variables X_{it} to the dependent variables, respectively.

First, equations (4.4) and (4.5) consider only two variables of FDI and EG. Next, the ER and EDU variables are added into equation (4.4) as X_{mit} with $m = 2$. Similarly, ER, INC, and POP variables are then added into equation (4.5) as X_{nit} with $n = 3$. The coefficients of the lagged $ECT_{i(t-1)}$ test whether there is a long-run causal relationship between FDI and EG. It also indicates that the two variables adjust to their long-run equilibrium relationships. If φ is statistically significant but ω is not statistically significant, EG Granger causes FDI. If the opposite happens, FDI Granger causes EG. If both φ and ω are significant, there is a long-run bi-directional relationship at the provincial level. In the short run, 'EG does not Granger cause FDI' and 'FDI does not Granger cause EG' if and only if all the coefficients of α_{2l} and β_{2k} are equal to zero, respectively.

The lag length selection is restricted in our study because the time span of the sample is short in terms of degrees of freedom. If three or more lags are used with five determinants and dependent, there will be at least 20 parameters (each of five variables has at least one current period and three lagged values). However, the time span is only 16 years (2000-2015) in our study. Therefore, the lag length of 2 is selected. Li et al. (2013) and Rao and Hassan (2011) select a lag length of 2 for a time span of 25 years (1982-2006) and 37 years (1971-2007), respectively.

National level: the cointegration – OLS – ECM approach is employed for the time series data. The FDI, EG, ER, OT and POP variables are used for 1990 to 2015. GDP represents EG in the regression models. In the first step, after the unit root tests (the ADF, PP, and DF-GLS test) are conducted; the long-term nexus between FDI and EG in Vietnam is examined using the Johansen cointegration test (Johansen, 1991, 1995) (see Model 8, Table 4.9).

Table 4.9 Models to Investigate the Long-run Relationship between FDI and EG at the National Level

Test	Model number	Model
Johansen Cointegration Test	**Model 8**	Series: FDI, EG, ER, OT,POP
Cointegrating Regression: FMOLS	**Model 9**	$FDI_t = f(EG_t, ER_t, OT_t)$
	Model 10	$EG_t = f(FDI_t, ER_t, OT_t, POP_t)$
VECM	**Model 11**	$\Delta FDI_t = f\left(FDI_{(t-k)}, EG_{(t-l)}\right)$
	Model 12	$\Delta FDI_t = f\left(FDI_{(t-k)}, EG_{(t-l)}, ER_t, OT_t\right)$
	Model 13	$\Delta EG_t = f\left(EG_{(t-l)}, FDI_{(t-k)}\right)$
	Model 14	$\Delta EG_t = f\left(EG_{(t-l)}, FDI_{(t-k)}, ER_t, OT_t, POP_t\right)$

Note: t stands for years, $\boldsymbol{k}$ and $\boldsymbol{l}$ are lag orders, and Δ is the difference operator; FDI is FDI registered capital, EG is economic growth represented by GDP, ER is exchange rate, OT is open trade, and POP is average population (definitions and sources of variables used are presented in Appendix Table B.11).

In the second step, the bi-directional link between FDI and EG is examined using the FMOLS cointegration regressions and the Wald test in two models: $FDI = f(EG, ER, OT)$ and $EG = f(FDI, ER, OT, POP)$ (see Models 9 and 10, Table 4.9). In the third step, four VEC models are used to identify the causality direction between FDI and EG. The coefficient of ecm(FDI) is examined using Model 11 with FDI (as the dependent variable) and EG only, and tested using Model 12 with the FDI, EG, ER and OT variables. Similarly, Model 13 is used to evaluate the coefficient of ecm(EG) with EG (as the dependent variable) and FDI, whereas Model 14 includes the EG, FDI, ER, OT and POP variables (see Table 4.9).

The estimated ECM takes the following form:

$$\Delta FDI_t = \alpha_0 + \varphi ECT_{(t-1)} + \sum \alpha_{1k} \Delta FDI_{(t-k)} + \sum \alpha_{2l} \Delta EG_{(t-l)} + \gamma_m X_{mt} + u1_t \quad (4.6)$$

$$\Delta EG_t = \beta_0 + \omega ECT_{(t-1)} + \sum \beta_{1l} \Delta EG_{(t-l)} + \sum \beta_{2k} \Delta FDI_{(t-k)} + \delta_n X_{nt} + u2_t \quad (4.7)$$

where Δ is the difference operator, $ECT_{(t-1)}$ is the error correction term (*ecm(FDI)* and *ecm(EG)*), which shows the long-run causalities from regressors to the dependent variables, φ and ω are coefficients of the ECT, α_{2l} and β_{2k} are coefficients, respectively showing the short-run causalities of EG on FDI and FDI on EG, $u1_t$ and $u2_t$ are the white noise error terms, t stands for Years, k and l are lag orders, γ and δ show exists of short run causalities from m and n independent variables X to dependent variables, respectively.

First, equations (4.6) and (4.7) have two variables, FDI and EG. Next, two economic variables (ER and OT) are added into equation (4.6) as X_m with $m = 2$. Similarly, the ER, OT, and POP variables are included into equation (4.7) as X_n with $n = 3$. The coefficients of the lagged ECT test whether there is a long-run causal relationship between FDI and EG. It also indicates that the two variables adjust to their long-run equilibrium relationships. If φ is statistically significant but ω is not statistically significant, EG Granger causes FDI. If the opposite happens, FDI Granger causes EG. If both φ and ω are significant, there is a long-run bi-directional relationship. In the short run, 'EG does not Granger cause FDI' and 'FDI does not Granger cause EG' if and only if all the coefficients of α_{2l} and β_{2k} are equal to zero, respectively.

4.6.1.2 Hypotheses 1.2 and 1.3

The OLS estimators are used to test $H_{1.2}$ and $H_{1.3}$ at the national level. The Hausman test (Hausman, 1978) is used to determine whether a fixed or random effects model is appropriate to estimate the panel data regression equations at the regional and provincial levels.

Table 4.10 The Models to Evaluate the Impact of FDI on EG at Various Levels in Vietnam

Variable group		Variable	Model					
			National level		Regional level		Provincial level	
			Model 15	Model 16	Model 17	Model 18	Model 19	Model 20
Dependent variable		GDP	x	x				
		RS			x	x	x	x
Regressors	FDI	FDI	x	x	x	x	x	x
	Demographic factor	POP	x	x	x	x	x	x
	Economic factors	ER	x	x	x	x	x	x
		OT	x	x				x
		ICOR		x				x
		INC		x		x		x
		CPI		x		x		x
		STATE		x				
		MKT		x				
		SCI		x				

Note: GDP is Gross Domestic Product, RS is Retails Sales, FDI is FDI registered capital, POP is average population, ER is Exchange Rate, OT is Open Trade, ICOR is Incremental Capital Output Ratio, INC is monthly average income, CPI is average Consumer Price Index representing inflation, STATE is the share of the state-owned investment, MKT is the share of the non-state-owned investment presenting marketization, and SCI is the share of science, technology and environment expenditure (definitions and sources of variables used are presented in Appendix Table B.11).

At the national level, the impact of FDI on EG in Vietnam is evaluated by testing $H_{1.2}$ *(FDI significantly, positively affects EG at the provincial, regional, and national levels in Vietnam)* based on Models 15 and 16 (see Table 4.10) with equation (4.8):

$$EG_t = \beta_0 + \beta_1 FDI_t + \mu_m X_{mt} + e_t \quad (4.8)$$

where β and μ are parameters, e is the error term, t stands for years, X_{mt} are m independent variables. For example, in Model 15, besides FDI, three variables, POP, ER, and OT, are included for 1990-2015 ($m = 3$). Model 16 is an extension with other six regressors (ICOR, INC, CPI, STATE, MKT and SCI) added into Model 15 for 1995-2015.

At the regional and provincial levels, $H_{1.2}$ is tested using Models 17, 18, 19, and 20 (see Table 4.10) with equations (4.9) and (4.10):

$$EG_{jt} = \beta_0 + \beta_1 FDI_{jt} + \mu_m X_{mjt} + \delta_j + \gamma_t + e_{jt} \quad (4.9)$$

$$EG_{it} = \beta_0 + \beta_1 FDI_{it} + \mu_m X_{mit} + \delta_i + \gamma_t + e_{it} \quad (4.10)$$

where β and μ are parameters, e is the error term, X_{mjt} and X_{mit} are m independent variables, j stands for regions, i stands for provinces, t stands for years, δ is the fixed effect for each cross-section, and γ is the random effect for each period. For example, in Model 19, besides FDI, POP and

ER are included for 2000-2015 ($m = 2$). Model 20 is an extension with other three regressors, ICOR, INC and CPI ($m = 5$) added into Model 19.

In terms of $H_{1.3}$ *(EG significantly, positively affects FDI attraction at the provincial, regional and national levels in Vietnam),* the impact of EG on FDI at the national level is evaluated using the OLS estimators from Models 21, 22, and 23 (Table 4.11) with equation (4.11):

$$FDI_t = \alpha_0 + \alpha_1 EG_t + \mu_m X_{mt} + e_t \quad (4.11)$$

where α and μ are parameters, e is the error term, X_{mt} are m independent variables, and t stands for years. For example, Model 21 evaluates the effect of EG on attracting FDI with other independent variables, ER and OT, in Vietnam for 1990-2015 ($m = 2$); Model 22, extended from Model 21, includes other variables, ICOR, INC, CPI, STATE, MKT and SCI, for 1995-2015 ($m = 8$); and LF and EDU are included in Model 22 ($m = 10$) to examine how EG affects FDI in Vietnam for 2000-2015 (see Model 23, Table 4.11).

Table 4.11 The Models to Evaluate the Impact of EG on FDI at Various Levels in Vietnam

Variable group		Variable	Model						
			National level			Regional level		Provincial level	
			Model 21	Model 22	Model 23	Model 24	Model 25	Model 26	Model 27
Dependent variable		FDI	x	x	x	x	x	x	x
Regressors	EG	GDP	x	x	x				
		RS				x	x	x	x
	Demographic and human capital factors	LF			x				
		EDU			x	x	x	x	x
	Economic factors	ER	x	x	x	x	x	x	x
		OT	x	x	x				
		ICOR		x	x				x
		INC		x	x		x		x
		CPI		x	x		x		x
		STATE		x	x				
		MKT		x	x				
		SCI		x	x				

Note: FDI is FDI registered capital, GDP is Gross Domestic Product, RS is Retails Sales, LF is Labour Force, EDU is Education Level, ER is Exchange Rate, OT is Open Trade, ICOR is Incremental Capital Output Ratio, INC is monthly average income, CPI is average Consumer Price Index representing inflation, STATE is the share of the state-owned investment, MKT is the share of the non-state-owned investment presenting marketization, and SCI is the share of science, technology and environment expenditure (definitions and sources of variables used are presented in Appendix Table B.11).

At the regional and provincial levels, $H_{1.3}$ is tested for 2000-2015. Models 24, 25, 26, and 27 (see Table 4.11) are employed with equations (4.12) and (4.13):

$$FDI_{jt} = \alpha_0 + \alpha_1 EG_{jt} + \mu_m X_{mjt} + \delta_j + \gamma_t + e_{jt} \quad (4.12)$$

$$FDI_{it} = \alpha_0 + \alpha_1 EG_{it} + \mu_m X_{mit} + \delta_i + \gamma_t + e_{it} \quad (4.13)$$

where α and μ are parameters, e is the error term, X_{mjt} and $X_{mit}$are m independent variables, j stands for regions, i stands for provinces, t stands for years, δ is the fixed effect for each cross-section, and γ is the random effect for each period. For example, in Models 24 and 26, besides EG, EDU and ER are included ($m = 2$). Model 25 is an extension of Model 24 with another two regressors, INC and CPI ($m = 4$). Model 27 is an extension with the other three regressors, ICOR, INC and CPI ($m = 5$) added into Model 26.

4.6.2 FDI Provincial Competition and the Effects of Policies

This section presents the empirical models to answer research question 2 (How does PCI-based and IIP-based competition affect FDI at the provincial level in Vietnam?). Panel data regression models are used to test $H_{2.1}$ and $H_{2.2}$ at the provincial level. The Hausman test (Hausman, 1978) is used to determine whether a fixed or random effect model is appropriate.

Table 4.12 The Models to Evaluate FDI Provincial Competition in Vietnam

Variable group		Variable	Model 28	Model 29	Model 30
Dependent variable		FDI	x	x	x
Regressors	EG	RS	x	x	x
	Human capital factor	EDU	x	x	x
	Economic factors	ER	x	x	x
		ICOR	x	x	x
		INC	x	x	x
		CPI	x	x	x
	Provincial competition and institutional factors	PCI	x		x
		ENTRY		x	
		LAND		x	
		ACCESS		x	
		TIME		x	
		CHARGE		x	
		PROACT		x	
		SUPPORT		x	
		LABOUR		x	
		LEGAL		x	
		IIP			x

Note: FDI is FDI registered capital, RS is Retails Sales, EDU is Education Level, ER is Exchange Rate, ICOR is Incremental Capital Output Ratio, INC is monthly average income, CPI is average Consumer Price Index representing inflation, PCI is Provincial Competitiveness Index, ENTRY is Entry Costs, LAND is Land Access and Security of Tenure, ACCESS is Transparency and Access to Information, TIME is Time Costs and Regulatory Compliance, CHARGE is Informal Charges, PROACT is Proactivity, SUPPORT is Business Support, LABOUR is Labour and Training, LEGAL is Legal Institutions, and IIP is Investment Incentive Policies index (definitions and sources of variables used are presented in Appendix Table B.11).

At the provincial level, the issue of "how PCI helps Vietnamese provinces to attract more or less FDI" is evaluated by testing $H_{2.1}$ *(provinces with better governance are strongly associated with registered FDI).* To test $H_{2.1}$, Models 28 and 29 (see Table 4.12) are employed with equation (4.13). Besides EG,

EDU, ER, ICOR, INC, and CPI, Model 28 examines the effects of PCI on FDI, whereas Model 29 investigates the effects of the nine PCI sub-indices on FDI. The IIP-based competition at the provincial level is investigated by testing $H_{2.2}$ *(provinces offering higher fiscal incentives attract less FDI)*. Model 30 is regressed with one variable, IIP, added into Model 28 (see Table 4.12).

4.6.3 The Effects of Laws on FDI

To answer research question 3 (Does the rule of law matter in attracting FDI in Vietnam?), Models 31, 32, 33a-c, 34a-c, 35a-c, 36a-c, and 37a-b are used to test the hypotheses related to the release of the new investment and enterprise laws in 2005 and Vietnam's participation in the WTO and FTAs.

Table 4.13 The Models to Evaluate the Effects of Laws on FDI at Vietnam's National and Regional Levels

Variable group		Variable	National level		Regional level					
			Model 31	Model 32	Model 33a	Model 33b	Model 33c	Model 34a	Model 34b	Model 34c
Dependent variable		FDI	x	x	x	x	x	x	x	x
Regressors	EG	GDP	x	x						
		RS			x	x	x	x	x	x
	Human capital factor	EDU	x	x	x	x	x	x	x	x
	Economic factors	ER	x	x	x	x	x	x	x	x
		ICOR	x	x	x	x	x	x	x	x
		INC	x	x	x	x	x	x	x	x
		CPI	x	x	x	x	x	x	x	x
		STATE	x	x						
	Policy and law related factors	LAW	x	x	x	x	x			
		WTO		x				x	x	x
		FTA		x				x	x	x
		RR			x	x		x	x	
		RR2					x			x
		LAW*RR				x				
		LAW*RR2					x			
		WTO*RR							x	
		WTO*RR2								x
		FTA*RR							x	
		FTA*RR2								x

Note: FDI is FDI registered capital, GDP is Gross Domestic Product, RS is Retails Sales, EDU is Education Level, ER is Exchange Rate, ICOR is Incremental Capital Output Ratio, INC is monthly average income, CPI is average Consumer Price Index representing inflation, STATE is the share of the state-owned investment, LAW is the dummy variable of Laws of Investment and Enterprise in 2005, WTO is the dummy variable indicating Vietnam joined WTO in 2007, FTA is the number of Free Trade Agreements in which Vietnam is a member, RR is Region Ranking, and RR2 is the dummy variable based on RR (definitions and sources of variables used are presented in Appendix Table B.11).

$H_{3.1}$ *(there is a significant growth of FDI in Vietnam, especially in the first ranked provinces following the release of the new law of investment and enterprise in 2005)* is tested with equations (4.11), (4.12), and (4.13) to evaluate the impact of investment and enterprise laws on FDI at the national,

regional, and provincial levels, respectively. LAW (a dummy variable) is included in Models 31, 32, 33a-c, 35a-c, and 37a-b (see Tables 4.13 and 4.14).

It is likely that provinces and regions under more difficult socio-economic conditions experienced higher impacts on FDI from the release of the new laws in 2005. To investigate the effect of LAW in the different regions and provinces of Vietnam, RR, RR2 and their interaction terms[28] with LAW (LAW*RR and LAW*RR2) are added into Models 33b and 33c; and PR, PR2 and their interaction terms with LAW (LAW*PR and LAW*PR2) are added into Models 35b and 35c. The use of interaction terms of region ranking (RR and RR2) and province ranking (PR and PR2) with LAW explores the different effects of the new investment and enterprise laws in 2005 on FDI in areas under different socio-economic conditions.

Table 4.14 The Models to Evaluate the Effects of Laws on FDI at the Vietnam Provincial Level

Variable group		Variable	Model							
			35a	35b	35c	36a	36b	36c	37a	37b
Dependent variable		FDI	x	x	x	x	x	x	x	x
Regressors	EG	RS	x	x	x	x	x	x	x	x
	Human capital factor	EDU	x	x	x	x	x	x	x	x
	Economic factors	ER	x	x	x	x	x	x	x	x
		ICOR	x	x	x	x	x	x	x	x
		INC	x	x	x	x	x	x	x	x
		CPI	x	x	x	x	x	x	x	x
	Policy and law related factors	PR	x	x		x	x		x	
		PR2			x			x		x
		LAW	x	x	x				x	x
		LAW*PR		x					x	
		LAW*PR2			x					x
		WTO				x	x	x	x	x
		FTA				x	x	x	x	x
		WTO*PR					x		x	
		FTA*PR					x		x	
		WTO*PR2						x		x
		FTA*PR2						x		x

Note: FDI is FDI registered capital, RS is Retails Sales, EDU is Education Level, ER is Exchange Rate, ICOR is Incremental Capital Output Ratio, INC is monthly average income, CPI is average Consumer Price Index representing inflation, PR is Province Ranking, PR2 is the dummy variable based on PR, LAW is the dummy variable of Laws of Investment and Enterprise in 2005, WTO is the dummy variable indicating Vietnam joined WTO in 2007, and FTA is the number of Free Trade Agreements in which Vietnam is a member (definitions and sources of variables used are presented in Appendix Table B.11.

[28] An interaction term shows the different effects of an independent variable on a dependent variable depending on values of another independent variable.

Similarly, $H_{3.2}$ *(there is a significant growth of FDI in Vietnam, especially in the first ranked provinces following Vietnam's WTO and FTA membership)* is tested at the national, regional, and provincial levels through Models 32, 34a-c, 36a-c, and 37a-b (see Tables 4.13 and 4.14) with WTO and FTA. The interaction terms of WTO*RR, WTO*RR2, FTA*RR, FTA*RR2, WTO*PR, WTO*PR2, FTA*PR and FTA*PR2 are employed to identify the different impacts of joining WTO and FTA on inward FDI at regional and provincial levels in Vietnam.

4.6.4 FDI Location Selection

To identify the determinants that affect the FDI location selection (research question 4: Is there any geographical concentration of FDI in Vietnam?), other regressors including the effect of the 2008 financial crisis (CRI), infrastructure conditions (FRE, BED, COM, and WEB), and institutional factors (CR) on attracting FDI in Vietnam are investigated using Models 38-52 (see Tables 4.15, 4.16, and 4.17). $H_{4.1}$ (geographical concentration of FDI exists in certain locations is affected by determinants of the FDI-inflow distribution in Vietnam) is tested as follows.

Table 4.15 The Models to Evaluate FDI Location Selection at the Vietnam National Level

Variable group		Variables	Model 38	Model 39
Dependent variable		FDI	x	x
Regressors	EG	GDP	x	x
	Human capital factor	EDU	x	x
	Economic factors	ER	x	x
		ICOR	x	x
		INC	x	x
		CPI	x	x
		STATE	x	x
		CRI	x	x
	Provincial competition and institutional factors	CR	x	x
	Infrastructure factors	COM		x
		FRE		x
		BED		x

Note: FDI is FDI registered capital, GDP is Gross Domestic Product, EDU is Education Level, ER is Exchange Rate, ICOR is Incremental Capital Output Ratio, INC is monthly average income, CPI is average Consumer Price Index representing inflation, STATE is the share of the state-owned investment, CRI is the dummy variable reflecting the financial crisis in 2008, CR is Country Risk index, COM is Communication development, FRE is Volume of Goods Freight, and BED is the number of patient beds (definitions and sources of variables used are presented in Appendix Table B.11).

First, the determinants related to the financial crisis and infrastructure conditions are regressed with CR. The variables representing the infrastructure conditions at the national level are COM, FRE, and BED (Model 39, Table 4.15), whereas those at the regional level are FRE and BED (Models 41 and 42, Table 4.16). COM is replaced by WEB at the provincial level (see Models 43-52, Table 4.17).

Table 4.16 The Models to Evaluate FDI Location Selection at the Vietnam Regional Level

Variable group		Variable	Model 40	Model 41	Model 42
Dependent variable		FDI	x	x	x
Regressors	EG	RS	x	x	x
	Human capital factor	EDU	x	x	x
	Economic factors	ER	x	x	x
		ICOR	x	x	x
		INC	x	x	x
		CPI	x	x	x
		CRI	x	x	x
	Provincial competition and institutional factors	CR	x	x	x
	Policy and law related factors	RR		x	
		RR2			x
	Infrastructure factors	FRE		x	x
		BED		x	x
	Interaction terms	CRI*RR2			x
		CR*RR2			x
		FRE*RR2			x
		BED*RR2			x

Note: FDI is FDI registered capital, RS is Retail Sales, EDU is Education Level, ER is Exchange Rate, ICOR is Incremental Capital Output Ratio, INC is monthly average income, CPI is average Consumer Price Index representing inflation, CRI is the dummy variable reflecting the financial crisis in 2008, CR is Country Risk index, RR is Region Ranking, RR2 is the dummy variable based on RR, FRE is Volume of Goods Freight, and BED is the number of patient beds (definitions and sources of variables used are presented in Appendix Table B.11).

Finally, to investigate the FDI-inflow distribution to different areas in Vietnam and its determinants, the interaction terms of RR2 with CRI, CR, FRE and BED at the regional level, and PR2 with CRI, CR, FRE, BED and WEB at the provincial level are included in Model 42 (see Table 4.16) and Models 45-47 and 50-52 (see Table 4.17), respectively. Models 42, 44-47 and 50-52 test whether there are significant relationships between the variables and FDI, especially in the first ranked regions and provinces. The use of the interaction terms generates different impacts of the variables on FDI in the areas under different socio-economic conditions.

Table 4.17 The Models to Evaluate FDI Location Selection at the Vietnam Provincial Level

Variable group		Variable	Models									
			43	44	45	46	47	48	49	50	51	52
Dependent variable		FDI	x	x	x	x	x	x	x	x	x	x
Regressors	EG	RS	x	x	x	x	x	x	x	x	x	x
	Human capital factor	EDU	x	x	x	x	x	x	x	x	x	x
	Economic factors	ER	x	x	x	x	x	x	x	x	x	x
		ICOR	x	x	x	x	x	x	x	x	x	x
		INC	x	x	x	x	x	x	x	x	x	x
		CPI	x	x	x	x	x	x	x	x	x	x
		CRI	x	x	x	x	x	x	x	x	x	x
	Provincial competition and institutional factors	PCI						x	x	x	x	x
		IIP	x	x	x	x	x	x	x	x	x	x
		CR	x	x	x	x	x	x	x	x	x	x
	Policy and law related factors	PR2		x	x	x	x		x	x	x	x
	Infrastructure factors	FRE	x	x	x	x	x	x	x	x	x	x
		BED	x	x	x	x	x	x	x	x	x	x
		WEB	x	x	x	x	x	x	x	x	x	x
	Interaction terms	CRI*PR2			x	x				x	x	
		CR*PR2			x	x				x	x	
		FRE*PR2			x		x			x		x
		BED*PR2			x		x			x		x
		WEB*PR2			x		x			x		x

Note: FDI is FDI registered capital, RS is Retails Sales, EDU is Education Level, ER is Exchange Rate, ICOR is Incremental Capital Output Ratio, INC is monthly average income, CPI is average Consumer Price Index representing inflation, CRI is the dummy variable reflecting the financial crisis in 2008, PCI is Provincial Competitiveness Index, IIP is Investment Incentive Policies index, CR is Country Risk index, PR2 is the dummy variable based on Province Ranking PR, FRE is Volume of Goods Freight, and BED is the number of patient beds, and WEB is Website Quality (definitions and sources of variables used are presented in Appendix Table B.11).

4.7 Conclusion

This chapter presents the data and the methodologies used in the study. Vietnam comprises six regions with 63 provinces and cities (as at 31 December, 2015). Data from 2000 to 2015 are grouped into the national, regional, and provincial levels (see Appendix Table B.11 for data sources).

There are 38 variables used in the study. The first three variables employed as dependent and independent variables in different regression models are FDI, GDP and RS. Although both GDP and RS represent EG, GDP represents EG at the national level, and RS represents it at regional and provincial levels. The independent variables include three demographic and human capital factors (POP, LF and EDU), nine economic factors (OT, ER, CPI, ICOR, INC, STATE, MKT, SCI and CRI), four infrastructure factors (FRE, BED, COM and WEB), seven policy and law related factors (FTA, WTO, LAW, PR, PR2, RR and RR2), and 12 provincial competition and institutional factors (IIP; PCI and its sub-indices including ENTRY, LAND, ACCESS, TIME, CHARGE, PROACT, SUPPORT, LABOUR, and LEGAL; and CR). EDU, ICOR,

CRI, WEB, FTA, WTO, LAW, PR, PR2, RR, RR2, IIP and CR are computed by the author (Appendix Table B.11 gives the definitions, units, and data sources).

Two annual panel data sets are used at the provincial and regional levels from 2000 to 2015. At the national level, a time series data set is used. To evaluate the long-term relationship between FDI and EG at the national level, the study period is 1990 to 2015 for the five variables FDI, GDP, OT, ER and POP.

The cointegration – OLS – ECM approach and the OLS estimation procedure are used to investigate the four research questions and hypotheses related to the relationship between FDI and EG, the FDI provincial competition and effects of policies, the effects of laws on FDI, and the geographical concentration of FDI in Vietnam. The cointegration – OLS – ECM approach is used to test $H_{1.1}$ (the long-term bi-directional relationship between FDI and EG) at the provincial and national levels. The OLS estimation procedure is applied to test $H_{1.2}$ and $H_{1.3}$ on the relationship between FDI and EG (research question 1), $H_{2.1}$ and $H_{2.2}$ on the FDI provincial competition and effects of policies (research question 2), $H_{3.1}$ and $H_{3.2}$ on the effects of laws on FDI (research question 3), and $H_{4.1}$ on the geographical concentration of FDI in Vietnam (research question 4). The Hausman test (Hausman, 1978) is used to determine whether a fixed or random effect model is appropriate to estimate the panel data regression equations at the regional and provincial levels.

There are 52 empirical models used in the study. To investigate the relationship between FDI and EG (research question 1), models 1-7 are used to examine the long-run relationship at the provincial level with the variables ER, EDU, POP and INC. At the national level, models 8-14 investigate the long-run relationship between FDI and EG. Models 15-20 and Models 21-27 evaluate the impacts of FDI on EG and the impacts of EG on FDI, respectively, at the national, regional and provincial levels.

The FDI provincial competition and the effects of policies (research question 2) are investigated using Models 28-30. The PCI-based competition is examined using Model 28 with the effects of PCI representing the economic governance as the provincial competition factor in attracting FDI. Model 29 investigates the effects of the nine PCI sub-indices on FDI. IIP-based competition at the provincial level is examined using Model 30 with one more variable, IIP, added to Model 28. The IIP index, which is the combination of free land, income tax and import tax exemption, is constructed based on regulations and laws in Vietnam from 2000 to 2015 at the provincial level.

The effects of laws on FDI (research question 3) are evaluated using Models 31-37b. LAW is included in Models 31, 32, 33a-c, 35a-c and 37a-b to test the impacts of investment and enterprise laws in 2005 on FDI at the national, regional and provincial levels. To explore the different effects of LAW in areas under different socio-economic conditions, RR, RR2 and their interaction terms with LAW are

added into Models 33b and 33c; PR, PR2 and their interaction terms with LAW are added into Models 35b and 35c. Similarly, WTO, FTA and their interaction terms with RR, RR2, PR and PR2 are employed in Models 32, 34a-c, 36a-c and 37a-b to identify the different impacts of joining WTO and FTA on inward FDI in different socio-economic conditions in Vietnam.

The FDI location selection (research question 4) is analysed by including the effect of the 2008 financial crisis (CRI), infrastructure conditions (FRE, BED, COM, and WEB), and institutional factors (CR) in regression Models 38-52. The variables representing the infrastructure conditions at the national level are FRE, BED and COM (in Models 38-39), whereas, at the regional level, FRE and BED are included in Models 40-42. COM is replaced by WEB at the provincial level in Models 43-52. To investigate the different impacts of the 2008 financial crisis, the infrastructure conditions and institutional factors on the FDI location selection in Vietnam, the interaction terms of RR2 with CRI, CR, FRE and BED at the regional level are included in Model 42; and the interaction terms of PR2 with CRI, CR, FRE, BED and WEB at the provincial level are included in Models 45-47 and 50-52.

Chapter 5

Empirical Results

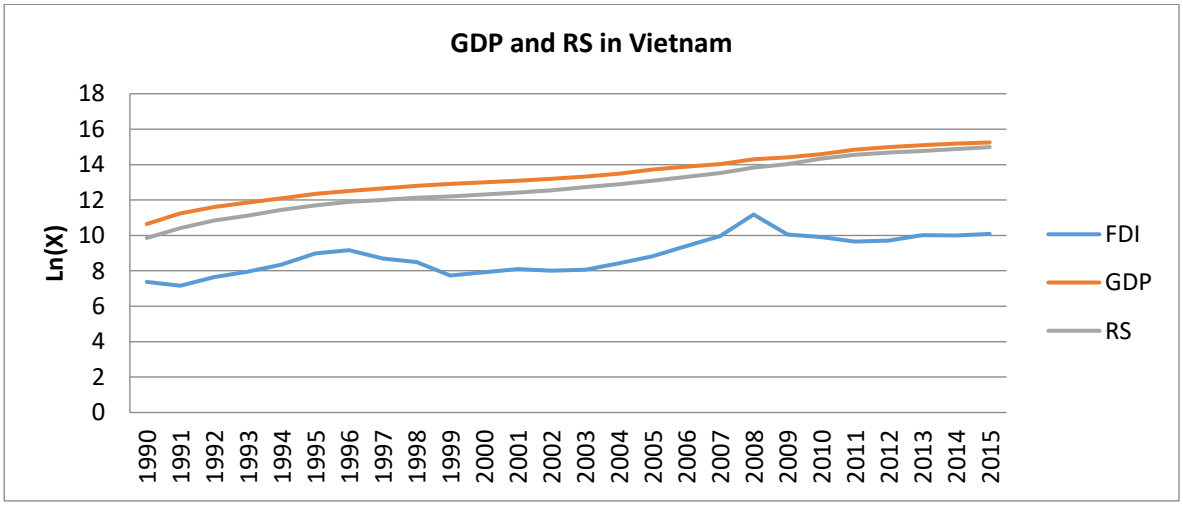
5.1 Introduction

This chapter presents the study's empirical results. Section 5.2 provides the descriptive statistics of the continuous, category and dummy variables at the national, regional and provincial levels. Section 5.3 details the empirical results of: (i) the relationship between FDI and EG at the national and provincial levels; (ii) the FDI competition and the effects of policies on FDI at the provincial level; (iii) the effects of laws on FDI at the national, regional and provincial levels; and (iv) the FDI location selection at the three levels. Section 5.4 summarises the chapter.

5.2 Descriptive Statistics

5.2.1 Dependent Variables

FDI and EG are the two dependent variables in this study. GDP represents EG at the national level and RS represents EG at the regional and provincial levels. Figure 5.1 shows the upward trend of FDI, GDP, and RS in Vietnam between 1990 and 2015. At the national level, GDP and RS closely follow each other (see Figure 5.1).



Note: Ln(X) is natural logarithm values of X representing FDI, GDP, and RS.

Source: Author's calculations

Figure 5.1 The Trends of FDI, GDP and RS in Vietnam 1990-2015

Table 5.1 presents the descriptive statistics of FDI and EG at the national, regional and provincial levels. The number of observations at the levels is 26, 96 and 960, respectively. The table reports the means, standard deviations (SD), minimum and maximum values of the variables. The values of FDI

and EG across the three data sets exhibit large SDs (see Table 5.1). A large SD indicates wide data dispersion among years in the different data sets and may show the heterogeneity of the variables. At the national level, the minimum value of FDI does not equal zero, which means that FDI flowed into Vietnam every year from 2000 to 2015. However, at the provincial level, FDI did not flow into a province or city every year during the period (the minimum value of FDI at the provincial level is 0). Appendix Figures C.1 to C.6 show the differences in FDI at the regional and provincial levels between 2000 and 2015.

Table 5.1 The Descriptive Statistics of the Dependent Variables

Variable	**FDI** (in million USD)			**EG** (in billion VND)		
Level	**National**	**Regional**	**Provincial**	**National (GDP)**	**Regional (RS)**	**Provincial (RS)**
Mean	12104.14	2683.03	438.52	1209868.73	212787.51	21278.75
SD	14555.44	4672.06	1957.32	1302023.59	240706.52	56101.38
Minimum	1284.4	1.6	0	41955	7599	289.6
Maximum	71726.8	32957	32019.6	4192862	1070878.4	711206.7

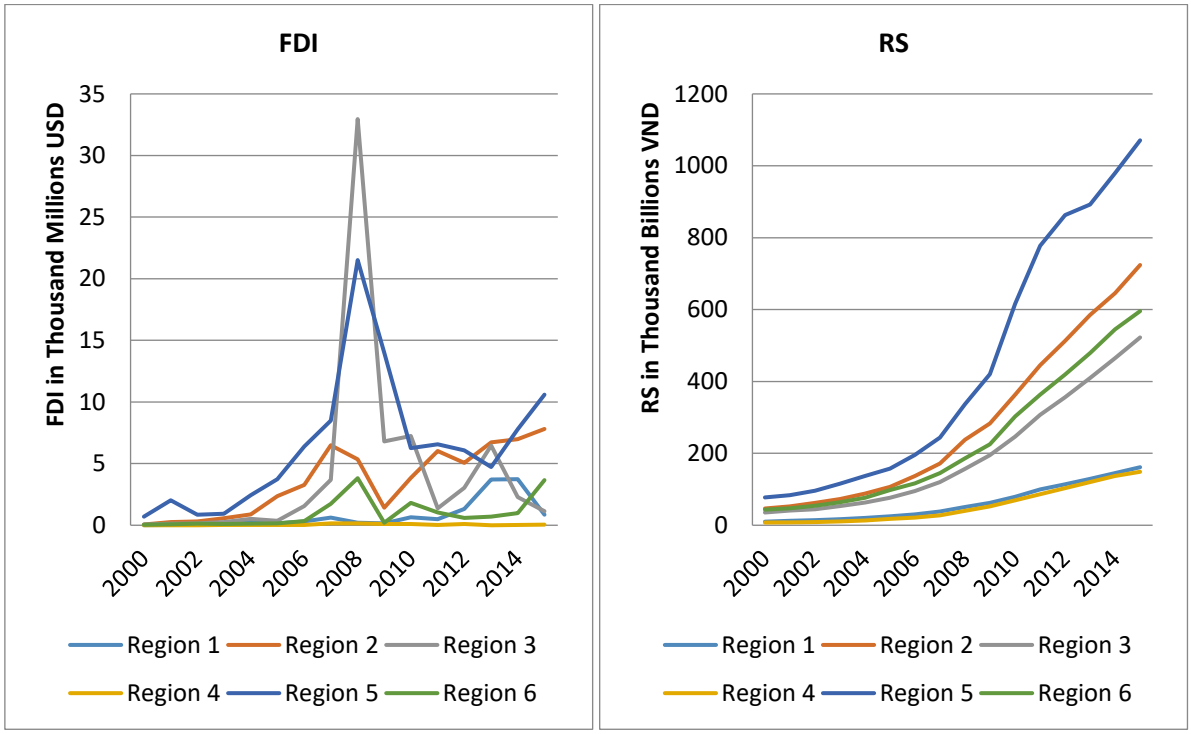
Source: Author's calculations

The trends in the FDI and RS of the six Vietnam regions are diverse between 2000 and 2015 (see Figure 5.2). Regions attracting more FDI (regions 2, 3, 5 and 6) experienced different RS trends from regions attracting less FDI (regions 1 and 4). For example, the FDI in regions 3 and 5 rose dramatically and peaked at 33 billion and 21.5 billion USD, respectively, in 2008; and RS in these two regions grew rapidly between 2008 and 2015. In contrast, the FDI in regions 1 and 4 did not have large fluctuations in 2008 and RS of the two regions increased gradually from 2008 to 2015. Appendix Figures C.1 and C.2 present scatterplots of the FDI and RS at the regional and provincial levels, respectively. At the provincial level, diversity among the trends in FDI and RS in 60 Vietnam provinces and cities 2000-2015 are recorded in Appendix Figures C.3 to C.8. The diversity provides suitable panel data sets to conduct the empirical study on the long-run nexus between FDI and EG at the regional and provincial levels in Vietnam. Appendix Figure C.9 is a scatterplot of the FDI and RS of the six Vietnam regions. Appendix Figures C.10 - C.15 are scatterplots of the FDI and RS at the provincial level in each region of Vietnam.

5.2.2 Explanatory Variables

This study uses three data sets for the national, regional and provincial levels. The explanatory variables employed at the different levels are different in both quantity and study period. At the national level, there are 19 independent variables of which 15 (POP, LF, EDU, OT, ER, CPI, ICOR, INC, STATE, MKT, SCI, FRE, BED, COM and CR) are continuous. To investigate the two way nexus between

FDI and EG in the long run, five variables, FDI[29], GDP, POP, OT and ER, are collected from 1990 to 2015 (26 years). Some variables, such as CPI, ICOR, INC, STATE, MKT and COM, are available from 1995, CR is available from 1996, EDU is available from 1999, and the remaining variables LF, SCI, FRE and BED are from 2000 to 2015. The other four variables including one categorical variable (FTA) and three dummy variables (CRI, LAW and WTO) are available between 1990 and 2015. Appendix Table B.10 shows the availability of the variables at the national level.



Note: Region 1: The Northern Midlands and Mountain Areas
Region 2: The Red River Delta
Region 3: The North Central and Central Coastal Areas
Region 4: The Central Highlands
Region 5: The South East
Region 6: The Mekong River Delta

Source: Author's calculations

Figure 5.2 The FDI and RS for the Six Regions of Vietnam 2000-2015

At the regional level, 16 independent variables are included in the panel data set over the 16 years from 2000 to 2015 (see Appendix Table B.10). Among them, 10 variables (POP, LF[30], EDU, ER, CPI, ICOR, INC, FRE, BED and CR) are continuous; two categorical variables are FTA and RR; and the four dummy variables are CRI, LAW, WTO and RR2.

At the provincial level, 21 of 28 independent variables are continuous (POP, LF, EDU, ER, CPI, ICOR, INC, FRE, BED, IIP, PCI, ENTRY, LAND, ACCESS, TIME, CHARGE, PROACT, SUPPORT, LABOUR, LEGAL

[29] The FDI data in 1990 include the FDI data for 1988 and 1990
[30] LF at the regional and provincial levels are available only from 2005 because of a lack of data.

and CR). There are three categorical variables, WEB, FTA and PR (see Appendix Table B.10). The remaining variables (CRI, LAW, WTO and PR2) are dummy. Most variables in the provincial data set are from 2000 to 2015; LF, PCI and its sub-indices (ENTRY, LAND, ACCESS, TIME, CHARGE, PROACT, SUPPORT, LABOUR and LEGAL) are available from 2005 to 2015.

5.2.2.1 Continuous variables

Tables 5.2, 5.3, and 5.4 present the data's descriptive statistics for the continuous variables at the provincial, regional, and national levels, respectively. The tables report the number of observations (Obs.), the mean, SD, and minimum (Min) and maximum (Max) values of the variables.

Table 5.2 The Descriptive Statistics of the Continuous Variables at the Provincial Level

Variable group	Variable	Obs.	Mean	SD	Min	Max
Human capital	**POP**	960	1417.346	1118.884	278.4	8146.3
	LF	660	834.4371	635.1635	168.4	4251.4
	EDU	960	2.40615	7.009913	0	53.9198
Economic	**ER**	960	17644.39	2584.304	14319.62	21920.68
	CPI	960	107.2444	5.821519	99.4	119.89
	ICOR	960	3.018775	0.990371	1.486202	5.361442
	INC	960	2321.848	1760.942	383.7	11895
Infrastructure	**FRE**	960	10015.16	13252.35	409.9	99443.1
	BED	960	3329.158	2916.947	792	25210
Provincial competition and institutional factors	**IIP**	960	0.639705	0.258593	0.012857	1
	PCI	660	56.98156	6.10465	36.75945	77.2
	ENTRY	660	7.864706	0.988831	3.641016	9.6
	LAND	660	6.257119	0.895592	3.04	8.84
	ACCESS	660	5.773868	0.916615	2.456816	8.85
	TIME	660	6.035468	1.150954	2.638305	8.93
	CHARGE	660	6.218255	1.003321	3.24	8.94
	PROACT	660	5.052521	1.343661	1.39	9.39
	SUPPORT	660	5.255351	1.39278	1.048505	9.620202
	LABOUR	660	5.244591	1.151627	0.999717	9.999575
	LEGAL	660	4.990719	1.233769	2	8.268376
	CR	960	0.6720	0.0241	0.625416	0.710504

Source: Author's calculations

CPI and ICOR (the economic factors), all variables in the provincial competition group and the institutional factors exhibit low SDs in the three data sets (see Tables 5.2, 5.3, and 5.4). In terms of

EDU (the human capital variable), low SD values are seen at the provincial and national levels (Tables 5.2 and 5.4), whereas a high SD value is present at the regional level (Table 5.3).

Table 5.3 The Descriptive Statistics of the Continuous Variables at the Regional Level

Variable group	Variable	Obs.	Mean	SD	Min	Max
Human capital	**POP**	96	14110.18	5149.877	4246.4	20925.5
	LF	66	8344.637	2957.792	2548.9	12032.6
	EDU	96	17.60696	13.19968	3.49275	45.5232
Economic	**ER**	96	17672.77	2562.539	14505.62	21914.56
	CPI	96	107.2444	5.84903	99.4	119.89
	ICOR	96	3.018775	0.995051	1.486202	5.361442
	INC	96	2554.301	2031.019	551.2	9979
Infrastructure	**FRE**	96	100151.6	84700.27	4834	396258.9
	BED	96	33291.58	13308.33	7961	61758
Institutional factors	**CR**	96	0.671996	0.024166	0.625416	0.710504

Source: Author's calculations

5.2.2.2 Categorical variables

The study uses four categorical variables, WEB (the infrastructure variable at the provincial level), FTA (the policy and law related factor at the three levels), PR (at the provincial level) and RR (at the regional level). Table 5.5 summarises these variables.

Table 5.4 The Descriptive Statistics of the Continuous Variables at the National Level

Variable group	Variable	Obs.	Mean	SD	Min	Max
Human capital	**POP**	26	79548.75	7734.526	66016.7	91713.3
	LF	16	47167.8125	5241.897	38545.4	53984.2
	EDU	17	18.3287298	6.673139	5.501777492	26.0550056
Economic	**OT**	26	90174.9385	98923.48	4425.2	327587.1
	ER	26	15229.4841	4015.176	6105.321043	21914.5599
	CPI	21	106.952857	5.680385	99.4	119.89
	ICOR	21	2.86723163	0.98161	1.438639342	5.36144248
	INC	21	2291.99286	1736.256	478.2	5695.3
	STATE	21	46.1904762	8.347389	33.9	59.8
	MKT	21	32.0761905	6.648978	22.6	38.7
	SCI	16	0.930625	0.345089	0.6	1.9
Infrastructure	**FRE**	16	600909.656	306204.6	194326.7	1123943.5
	COM	21	56322.4334	61676.37	746.467	148548.6
	BED	16	199749.5	38052.8	158873	266395
Institutional factors	**CR**	20	0.67476441	0.03372	0.625415743	0.74002217

Source: Author's calculations

In Table 5.5, 18 of 960 data points show that a website is very good (WEB = 5) and satisfied five conditions: i) availability of more than one language; ii) availability of law documents; iii) economics

and social information (on English language page); iv) documents on investment registration (on English language pages); v) online registration and support (on English language pages). However, the number of data points indicating very poor websites (WEB = 0) is the largest category (336 of 960 data points). This implies that foreign investors may encounter difficulty accessing official information using the state bodies' electronic portals.

Table 5.5 A Summary of the Categorical Variables

Variable group	Variable	Values	Entries	Count		
				Provincial	Regional	National
Infrastructure	**WEB**[1]	0	No factors	336		
		1	1 factor	124		
		2	2 factors	62		
		3	3 factors	255		
		4	4 factors	165		
		5	5 factors	18		
		Total		***960***		
Policy and law related	**FTA**[2]	0	0 FTA	0	0	3
		1	1 FTA	60	6	8
		2	2 FTAs	240	24	4
		3	3 FTAs	120	12	2
		4	4 FTAs	60	6	1
		5	5 FTAs	60	6	1
		6	6 FTAs	60	6	1
		7	7 FTAs	0	0	0
		8	8 FTAs	120	12	2
		9	9 FTAs	180	18	3
		10	10 FTAs	60	6	1
		Total		***960***	***96***	***26***
	PR[3]	0	None	90		
		1	Difficult	132		
		2	Extreme difficult	738		
		Total		***960***		
	RR[3]	0	Own any province having PR = 0		30	
		2	Own only provinces having PR = 2		48	
		1	Otherwise		18	
		Total			***96***	

Note: [1] Appendix Tables B.4 and B.5 provide definitions of WEB
[2] Appendix Table B.6 shows how to define FTA
[3] Appendix Tables B.7 and B.8 present how to construct PR and RR, respectively.
Source: Author's calculations

FTA is categorised from 0 to 10. Table 5.5 shows none of the FTA data points are either 0 or 7. The number of data points indicating FTA = 2 is the largest at the provincial, regional and national levels (see Table 5.5).

From 2000 to 2015, most Vietnam provinces and cities are on the list of areas under extremely difficult socio-economic conditions, which shows in Table 5.5 with 738 of 960 data points indicating PR = 2. At the regional level, a half of the regions are under the extremely difficult socio-economic

condition (RR=2), which is reported in Table 5.5 with 48 of 96 data points showing that all provinces in the regions are under the extremely difficult socio-economic conditions.

5.2.2.3 Dummy variables

The summary of dummy variables is shown in Table 5.6. Three variables, CRI, LAW, and WTO, take a value of 0 or 1 at the provincial, regional, and national levels. Two variables, PR2 and RR2, are defined at the provincial and regional levels, respectively.

Table 5.6 A Summary of the Dummy Variables

Variable groups	Variables	Values	Entries	Count		
				Provincial	Regional	National
Economic	**CRI**	1	The financial crisis in 2008	480	48	8
		0	Before the financial crisis in 2008	480	48	18
		Total		***960***	***96***	***26***
Policy and law related	**LAW**	1	Vietnam had new Investment and Enterprise laws in 2005	660	66	11
		0	Before Vietnam had new Investment and Enterprise laws in 2005	300	30	15
		Total		***960***	***96***	***26***
	WTO	1	Vietnam joined in WTO in 2007	540	54	9
		0	Before Vietnam joined in WTO in 2007	420	42	17
		Total		***960***	***96***	***26***
	PR2	1	PR = 2	738		
		0	Otherwise	222		
		Total		***960***		
	RR2	1	RR = 2		48	
		0	Otherwise		48	
		Total			***96***	

Source: Author's calculations

5.3 Empirical Results

This section presents the empirical results of the FDI and EG relationship, the FDI competition and the effects of policies at the provincial level, the effects of laws on FDI, and the FDI location selection in Vietnam.

5.3.1 The Relationship between FDI and EG

The tests of $H_{1.1}$, $H_{1.2}$, and $H_{1.3}$ are reported in sections 5.3.1.1 (Long-term nexus between FDI and EG), 5.3.1.2 (Impacts of FDI on EG), and 5.3.1.3 (Impacts of EG on FDI), respectively.

5.3.1.1 Long-term Nexus between FDI and EG

The long-term nexus between FDI and EG in Vietnam is investigated at the provincial and national level using the cointegration – OLS – ECM approaches.

5.3.1.1.1 Cointegration – OLS – ECM Approach at the Provincial Level

The cointegration – OLS – ECM empirical results of the long-term nexus between FDI and EG at the provincial level are as follows.

Step 1 - Evaluate the long-term relationship between FDI and EG

Before evaluating the long-term relationship, the stationarity of the panel data is examined using the three panel unit root tests including the LLC, IPS, and Fisher-ADF tests. Table 5.7 shows that the null hypotheses of non-stationarity of all variables (FDI, EG, ER, EDU, POP, and INC) in equations (4.6) and (4.7) at the level in the panel series cannot be rejected, while the first difference panel series reject the null hypotheses of non-stationarity of all variables.

Table 5.7 The Test Statistics of the Panel Unit Root Tests for FDI, EG, ER, EDU, POP, and INC

	Levin, Lin & Chu t		**Im, Pesaran and Shin**		**ADF-Fisher**	
	Level	*1st difference*	*Level*	*1st difference*	*Level*	*1st difference*
FDI	-17.4722***	-32.5560***	-11.5033***	-30.6297***	391.0360***	845.1260***
EG	4.2469	-3.2943***	7.6692	-2.9663***	90.7047	145.7540**
ER	13.0117	-7.7749***	15.0365	-7.7689***	1.3474	247.9880***
EDU	-2.3976***	-21.8140***	1.8366	-16.1955***	98.2804	459.5170***
POP	-7.5561***	-6.5706***	3.5863	-2.5047***	234.8040***	166.4090***
INC	24.7446	-15.9679***	27.0802	-16.8065***	6.9339	563.2790***

Note: FDI is FDI registered capital, Retails Sales (RS) represents Economic Growth (EG), ER is Exchange Rate, INC is monthly average income, EDU is education level, and POP is average population; the automatic lag length selection is based on the Schwarz Information Criterion (SIC) with maximum lag; the spectral estimation is based on the Bartlett Kernel method and the Newey-West automatic bandwidth selection; *** indicates that the null hypotheses of a unit root are rejected at the 1% significance level.
Source: Author's calculations

However, in terms of individual series, there are mixed results of stationarity of EDU and POP shown in the three different panel unit root tests (see Table 5.7). For example, the null hypotheses of non-stationarity of EDU and POP at the level are rejected in the LLC test but not rejected in the IPS test. The results indicate that most variables are non-stationary panel series at the level, and all variables are non-stationary panel series and integrated of first order $I(1)$. The variables that are non-stationary panel series and integrated of first order $I(1)$ enables us to conduct the panel cointegration test to investigate the long-term nexus between FDI and EG. Three types of panel cointegration test employed are Pedroni (Pedroni, 2004), Kao (Kao, 1999) and Johansen-Fisher (Maddala & Wu, 1999).

Table 5.8 The Panel Cointegration Tests for FDI, EG, ER, and INC

Test		Statistics			
		v-St	*rho-St*	*PP-St*	*ADF-St*
Pedroni	Panel	-2.6541	-2.2812**	-40.7588***	-19.8824***
	Panel weight	-3.9303	-1.0027	-22.6665***	-15.2488 ***
	Group		0.8837	-39.4636***	-20.9859***
Kao	t-Statistic	-6.9117***			
Fisher	Fisher Statistics (from trace test)	1279.0***			
	Fisher Statistics (from max-eigen test)	888.1***			

Note: The panel cointegration tests are conducted with a selection of individual intercept; the automatic lag length selection is based on the SIC with maximum lag; the spectral estimation is based on the Bartlett Kernel method and the Newey-West automatic bandwidth selection; ******* indicate that the null hypotheses of no cointegration are rejected at the 1% significance level; St stands for Statistics.
Source: Author's calculations

First, the three panel cointegration tests are conducted for FDI, EG, ER and INC, which have consistent results of the three panel unit root tests, LLC, IPS and ADF-Fisher (see Table 5.8). Next, similar tests are employed for FDI, EG, ER, INC and the other two variables (EDU and POP) that have mixed results in the unit root tests (see Table 5.9).

Table 5.9 The Panel Cointegration Tests for FDI, EG, ER, INC, EDU, and POP

Test		Statistics			
		v-St	*rho-St*	*PP-St*	*ADF-St*
Pedroni	Panel	-4.5085	2.7285	-67.5182***	-18.2713***
	Panel weight	-6.9008	4.6754	-28.8356***	-16.7591***
	Group		7.3655	-46.9385***	-21.4293***
Kao	t-Statistic	-7.291565***			
Fisher	Fisher Statistics (from trace test)	4789.0***			
	Fisher Statistics (from max-eigen test)	2197.0***			

Note: The panel cointegration tests are conducted with a selection of individual intercept; the automatic lag length selection is based on the SIC with maximum lag; the spectral estimation is based on the Bartlett Kernel method and the Newey-West automatic bandwidth selection; ******* indicate that the null hypotheses of no cointegration are rejected at the 1% significance level; St stands for Statistics.
Source: Author's calculations

The results in Tables 5.8 and 5.9 show that all tests reject the null hypotheses of no cointegration among the six variables (FDI, EG, ER, EDU, POP and INC) at the 1% significance level, which suggests that there is at least a long-term cointegration relationship between FDI and EG.

Step 2 - Re-evaluate the relationship between FDI and EG using the OLS estimator

The bi-directional link between FDI and EG is examined using the Panel FMOLS cointegration regressions applied for Models 2 and 3, Table 4.8. The two models are extended into six sub-models 2a, 2b, 2c, 3a, 3b and 3c as shown in Table 5.10.

Table 5.10 The Models Used in the Panel FMOLS Cointegration Regressions

Model			2			3		
Sub-model			2a	2b	2c	3a	3b	3c
Dependent variable	FDI	FDI	x	x	x			
	EG	RS				x	x	x
Regressor	EG	RS	x	x	x			
	FDI	FDI				x	x	x
	Economic factors	ER		x	x		x	x
		INC					x	x
	Human capital and demographic factors	EDU			x			
		POP						x

Note: FDI is FDI registered capital, Retails Sales (RS) represents Economic Growth (EG), ER is Exchange Rate, INC is Monthly Average Income, EDU is Education Level, and POP is Average Population (definitions and sources of variables used are presented in Appendix Table B.11).

Table 5.11 shows the results of the panel FMOLS cointegration regressions (FDI is the dependent variable). The panel FMOLS cointegration regressions are conducted through a weighted estimation panel method with two cointegrating equation deterministics including *a constant (level) option* and *a constant (level) and linear trend option*. The results show that the hypothesis of no link running from EG to FDI are rejected in both the constant (level) option and the constant (linear) and linear trend option at the provincial level in Vietnam.

Table 5.11 The Panel FMOLS Cointegration Regressions Applied for Model 2

Cointegrating equation deterministic	Coefficient					
	Constant (level)			Constant (level) and Linear Trend		
Models	2a	2b	2c	2a	2b	2c
RS	1.0840*** (297.2588)	1.0999*** (157.8416)	1.0285*** (146.5557)	1.8701*** (62.7049)	1.9785*** (65.9331)	1.8341*** (60.7187)
ER		-0.0735*** (-4.9750)	0.3992*** (26.5549)		-1.6565*** (-68.1113)	-1.1896*** (-48.5417)
EDU			0.0212** (2.1145)			-0.0195 (-0.5668)
R-squared	0.627581	0.627496	0.564073	0.691404	0.691601	0.58498
Long-run variance	2.110705	1.895423	1.773422	1.783068	1.590764	1.484018
S.E. of regression	1.5953	1.5964	1.7280	1.5071	1.5075	1.7500

Note: FDI is the dependent variable; RS represents EG; FDI, RS, and ER are natural logarithm values; the total number of observations is 900 (15 periods from 2001 to 2015 and 60 cross-sections); Values in parentheses indicate t-statistics; *** and ** denote statistical significance at 1% and 5% level, respectively.
Source: Author's calculations

In addition, a significant link running from ER to FDI is found in Models 2b and 2c (see Table 5.11). EDU, the variable with mixed results in the unit root tests, has a significant link to FDI in the constant option and an insignificant link to FDI in the constant and linear trend option.

The results of the panel FMOLS cointegrating regressions (EG is the dependent variable) are reported in Table 5.12. The results reject the hypothesis of no link running from FDI to EG in both the constant (level) option and the constant (linear) and linear trend option at the provincial level in Vietnam. Significant links from ER and INC to EG are found in Models 3b and 3c (see Table 5.12). POP, which is the variable with mixed results in the unit root tests, significantly links to EG. However, the POP-to-EG links are positive in the constant option and negative in the constant and linear trend option (see results in Model 3c, Table 5.12).

Therefore, the hypothesis of no bi-directional relationship between FDI and EG at the provincial level is rejected. The results (see Tables 5.11 and 5.12) show that there is a positive bi-directional link between FDI and ER at the provincial level in Vietnam. EDU has significant positive effect on attracting FDI, whereas POP and INC significantly impact EG at the provincial level in Vietnam.

Table 5.12 The Panel FMOLS Cointegration Regressions Applied for Model 3

Cointegrating equation deterministic	**Coefficient**					
	Constant (level)			**Constant (level) and Linear Trend**		
Models	**3a**	**3b**	**3c**	**3a**	**3b**	**3c**
FDI	0.7667*** (21.5992)	-0.0116 (-0.2789)	0.1900*** (4.5559)	0.1997*** (4.0121)	0.1710*** (3.4120)	0.1527*** (3.0432)
ER		3.2008*** (193.4593)	3.3430*** (191.7995)		0.7836*** (32.9512)	0.8070*** (33.8841)
INC		0.7157*** (52.5170)	0.5778*** (42.1356)		0.2003*** (4.5829)	0.1835*** (4.2429)
POP			0.1586*** (57.9789)			-0.2821*** (-12.8512)
R-squared	0.627581	0.973512	0.917822	0.947608	0.961410	0.968222
Long-run variance	2.110705	0.034132	0.023884	0.014507	0.010690	0.009527
S.E. of regression	1.2397	0.2114	0.3725	0.3081	0.2648	0.2404

Note: RS representing EG is a dependent variable; RS, FDI, ER, INC, and POP are natural logarithm values; the total number of observations is 900 (15 periods from 2001 to 2015 and 60 cross-sections); Values in parentheses indicate t-statistics; *** denote statistical significance at 1% level.
Source: Author's calculations

Step 3 - Investigate the causality direction between FDI and EG

The results (see Tables 5.7, 5.8, and 5.9) show that there is at least a long-term cointegration relationship between FDI and EG. Therefore, Panel VEC models are employed to investigate the

causality direction between FDI and EG. Four Panel VEC Models 4-7 (see Table 4.8) are used to identify the existence and the direction of causality between FDI and EG at the provincial level.

The estimated results of the Panel VEC Models 4 and 6 are shown in Table 5.13. The results show no long-run bi-directional nexus between FDI and EG at the provincial level in Vietnam with only two endogenous variables of FDI and EG. The negative, significant ecm(RS) (see Model 6, Table 5.13) shows there is a long-run causality running from FDI to EG. In other words, the effect of FDI on EG is a long-term process. However, the positive, insignificant ecm(FDI) (see Model 4, Table 5.13) shows there is no long-run causality running from EG to FDI.

In addition, the null hypotheses that the regression coefficients of D[RS(−1)] and D[RS(−2)] are equal to zero are not rejected (see Model 4, Table 5.13). This indicates that RS is not Granger causal for FDI in the short term. The significant coefficient of D[FDI(-1)] and insignificant coefficient of D[FDI(-2)] in Model 6 show that FDI is Granger causal for EG in the short term (the first lag). This means there is a short-term causality from FDI to EG at the provincial level in Vietnam. In other words, the short-term changes in FDI affect the EG changes, whereas short-term changes of EG may marginally affect FDI changes.

Table 5.13 The Results of Panel VEC Models 4 and 6 without Exogenous Variables

Model 4 - D(FDI)		Model 6 - D(RS)	
Variable	**Coefficient**	**Variable**	**Coefficient**
c	0.2567 (1.4267)	c	0.1173*** (11.8959)
ecm(FDI)	0.0048 (0.3898)	ecm(RS)	-0.0313*** (-8.7601)
D[FDI(-1)]	-0.6331*** (-18.0350)	D[FDI(-1)]	-0.0058*** (-3.0003)
D[FDI(-2)]	-0.3947*** (-11.4288)	D[FDI(-2)]	-0.0030 (-1.6101)
D[RS(-1)]	0.8792 (1.3174)	D[RS(-1)]	0.1757*** (4.8033)
D[RS(-2)]	-0.2930 (-0.4713)	D[RS(-2)]	0.1731*** (5.0822)

Note: RS represents EG; FDI and RS are natural logarithm values; Values in parentheses indicate t-statistics; ecm(FDI) and ecm(RS) are the panel error correction terms; the lag length is 2; the adjusted sample is for 2003-2015 with 780 observations after adjustments; D[FDI(−1)] and D[FDI(−2)] are the lag-1 and lag-2 first differential panel series of FDI respectively; D[RS(-1)] and D[RS(−2)] are the lag-1 and lag-2 first differential panel series of RS respectively; *** indicates the null hypotheses that the coefficients of variables are equal to zero are rejected at the 1% significance level.
Source: Author's calculations

The estimated results of the Panel VEC Models 5 and 7 are shown in Table 5.14. Interestingly, the results show a long-run interactive relationship between FDI and EG at the provincial level in Vietnam with the other exogenous variables. Both ecm(FDI) and ecm(RS) have negative, significant values (see Table 5.14), which shows that there is a two-way nexus between FDI and EG in the long term.

Table 5.14 The Results of the Panel VEC Models 5 and 7 with Exogenous Variables

Model 5 - D(FDI)		Model 7 - D(RS)	
Variable	**Coefficient**	**Variable**	**Coefficient**
c	23.1442*** (4.9676)	c	3.0324*** (6.7062)
ecm(FDI)	-0.2146*** (-5.7203)	ecm(RS)	-0.0120*** (-2.6752)
D[FDI(-1)]	-0.4944*** (-11.8776)	D[FDI(-1)]	-0.0065*** (-2.9354)
D[FDI(-2)]	-0.3264*** (-9.0506)	D[FDI(-2)]	-0.0045** (-2.3236)
D[RS(-1)]	0.6225 (0.9582)	D[RS(-1)]	0.1482*** (4.2459)
D[RS(-2)]	0.0369 (0.0609)	D[RS(-2)]	0.2012*** (6.1675)
ER	-2.3429*** (-4.9322)	ER	-0.3051*** (-5.8954)
EDU	0.0013 (1.5101)	INC	0.0036 (0.3102)
		POP	0.0070 (1.0087)

Note: RS represents EG; FDI, RS, ER, INC, and POP are natural logarithm values; Values in parentheses indicate t-statistics; ecm(FDI) and ecm(RS) are the panel error correction terms; the lag length is 2; the adjusted sample is for 2003-2015 with 780 observations after adjustments; D[FDI(−1)] and D[FDI(−2)] are the lag-1 and lag-2 first differential panel series of FDI, respectively; D[RS(-1)] and D[RS(−2)] are the lag-1 and lag-2 first differential panel series of RS, respectively; ** and *** indicate the null hypotheses that the coefficients of variables are equal to zero are rejected at 5% and 1% significance level, respectively.
Source: Author's calculations

In the short term, the null hypothesis that the regression coefficients of D[RS(−1)] and D[RS(−2)] are equal to zero is not rejected. This indicates RS is not Granger causal for FDI (see Model 5, Table 5.14). However, FDI is Granger causal for EG in the short term with significant coefficients of D[FDI(-1)] and D[FDI(-2)] in Model 7 (see Table 5.14). The results also show that ER has significant effects on changes in both FDI and EG in the short term at the provincial level in Vietnam.

In conclusion, there is a long-term nexus between FDI and EG at provincial level in Vietnam with both the endogenous and exogenous variables included in the empirical Panel VEC models. If the models include only FDI and EG, the effect of FDI on EG is a long-term process and there is no long-run causality running from EG to FDI. With and without exogenous variables, there is a short-term causality from FDI to EG at the provincial level in Vietnam. In other words, short-term changes of FDI affect EG changes, whereas short-term changes of EG may have marginal effects on FDI changes.

5.3.1.1.2 Cointegration – OLS – ECM Approach at the National Level

This section reports the cointegration – OLS – ECM approach's empirical results of the long-term nexus between FDI and EG at the national level.

Step 1: Evaluate the long-term relationship between FDI and EG

The long-term nexus between FDI and EG in Vietnam is examined using the Johansen cointegration test (Johansen, 1991, 1995) for time-series data after conducting the unit root tests (the ADF, PP, and DF-GLS tests).

Table 5.15 The Test Statistics of the Unit Root Tests for the Time Series FDI, EG, ER, OT, and POP

		Level			*1st difference*		
		None	Intercept	Trend and Intercept	None	Intercept	Trend and Intercept
ADF Test	FDI	-1.79667*	-2.73221*	-3.56228*	-6.81553***	-6.70623***	-6.55207***
	GDP	0.996026	-1.67949	-2.92217	-0.74424	-1.53493	-2.41371
	OT	7.500129	4.793202	2.018677	0.52807	-0.51828	-4.70273***
	ER	2.154077	-1.72043	-4.26877**	-2.98212***	-7.2915***	-7.0044***
	POP	1.636895	0.420109	-2.83851	-1.76868*	-1.77357	-0.22934
PP Test	FDI	-1.79667*	-2.67353*	-3.56228*	-7.90526***	-8.37371***	-8.13132***
	GDP	7.293286	4.603209	0.654348	-0.69134	-1.47768	-2.70224
	OT	10.13428	10.57179	3.493559	-1.83663*	-2.73039*	-5.4312***
	ER	2.101398	-1.703	-4.30762**	-5.70452***	-6.96913***	-6.82132***
	POP	13.12623	-5.09805***	-2.80466	-1.48484	-1.69869	-0.46963
DF-GLS Test	FDI		-2.72086**	-3.71068***		-6.85427***	-6.85460***
	GDP		-1.20687	-3.15468***		-1.65250	-2.78198**
	OT		-0.29566	-1.28937		-0.40915	-5.35943***
	ER		-0.37163	-3.50931***		-1.37113	-2.37146**
	POP		1.60959	-3.21503***		-1.07769	-1.31757

Note: ***, **, and * indicate that the null hypotheses of a unit root are rejected at the 1%, 5%, and 10% significance levels, respectively; the sample is from 1990 to 2015; the automatic lag length selection is based on the SIC with maximum lag for the ADF and the DF-GLS tests; the bandwidth of the Bartlett Kernel method is chosen for the PP test (Newey and West, 1987).
Source: Author's calculations

The results in Table 5.15 show that the null hypothesis of non-stationarity of all variables involved in equations (4.4) and (4.5) (FDI, EG, ER, OT and POP) at the level in the time series is not rejected. However, at the first difference, the null hypothesis of non-stationarity of all variables is rejected. This indicates that the variables are non-stationary at the level and integrated at the first order $I(1)$.

Table 5.16 The Johansen Cointegration Tests for FDI, EG, ER, OT and POP

Hypothesized No. of CE(s)	***Eigenvalue***	***Trace Statistic***	***Max-Eigen Statistic***
None*	0.9986	271.4756*** (69.8189)	150.5867*** (33.8769)
At most 1*	0.8962	120.8890*** (47.8561)	52.1063*** (27.5843)
At most 2*	0.7291	68.7826*** (29.7971)	30.0383*** (21.1316)
At most 3*	0.6236	38.7443*** (15.4947)	22.4754*** (14.2646)
At most 4*	0.5070	16.2690*** (3.8415)	16.2690*** (3.8415)

Note: The cointegration tests are conducted with cointegration test specifications of allowing for linear deterministic trend in data with Intercept (no trend) in CE and test VAR; CE is cointegrating equation(s); Trace and Max-eigenvalue tests indicate 5 cointegrating equations; $r = \overline{0,4}$; $g = 5$; * denotes rejection of the null hypothesis at 5% significance level; ******* indicates the null hypothesis is rejected at the 1% significance level; values in parentheses indicate 0.05 critical values.
Source: Author's calculations

Table 5.16 reports the results of the Johansen test. The results reject all null hypotheses of the number of cointegration vectors from "None" to "At most 4" among the five variables (FDI, EG, ER, OT and POP). This means that there is a long-term cointegration relationship at least between FDI and EG.

Step 2: Re-evaluate the relationship between FDI and EG using the OLS estimator

The bi-directional link between FDI and EG is examined using FMOLS estimators (Phillips & Hansen, 1990) applied for Models 9 and 10, Table 4.9. The two models are extended into six sub-models, 9a, 9b, 9c, 10a, 10b, and 10c, shown in Table 5.17.

Table 5.17 The Models Used in the FMOLS Cointegration Regressions

Model			**9**			**10**		
Sub-model			**9a**	**9b**	**9c**	**10a**	**10b**	**10c**
Dependent variable	FDI	FDI	x	x	x			
	EG	GDP				x	x	x
Regressor	EG	GDP	x	x	x			
	FDI	FDI				x	x	x
	Economic factors	ER		x	x		x	x
		OT			x		x	x
	Demographic factor	POP						x

Note: FDI is FDI registered capital, GDP represents economic growth (EG), ER is Exchange Rate, OT is Open Trade, and POP is average population (definitions and sources of variables used are presented in Appendix Table B.11).

Table 5.18 reports the results of the FMOLS cointegration regressions (FDI is the dependent variable) using a weight estimation panel method with two cointegrating equation deterministics (a constant (level) option, and a constant (level) and linear trend option). The results show that with the constant (level) option, the hypothesis of no link running from EG to FDI at the national level is rejected (see Models 9a-c, Table 5.18). In terms of the constant and linear trend option, the hypothesis is also rejected (see Models 9a-c, Table 5.18). In addition, a significant link from ER to FDI is found in sub-models 9b and 9c, but no significant link between OT and FDI is found in any models (see Table 5.18).

Table 5.18 The FMOLS Cointegration Regressions (Model 9)

Cointegrating equation deterministic	**Coefficient**					
	Constant (level)			**Constant (level) and Linear Trend**		
Models	**9a**	**9b**	**9c**	**9a**	**9b**	**9c**
GDP	0.7101*** (4.6149)	1.9226*** (5.3771)	3.1262** (2.5016)	3.1868* (2.0612)	2.9391*** (3.2210)	3.1904** (2.6504)
ER		-6.1645*** (-3.4576)	-6.7760*** (-4.1233)		-5.3473*** (-3.0909)	-5.3400** (-2.7816)
OT			-0.9651 (-0.9363)			-0.0725 (-0.0694)
R-squared	0.658178	0.855451	0.844428	0.703735	0.833827	0.832283
Long-run variance	0.788085	0.357251	0.289950	0.729051	0.236887	0.237030

Note: FDI is the dependent variable; GDP represents EG; FDI, GDP, ER, and OT are natural logarithm values; the total number of observations is 25 after adjustments (1991-2015); Values in parentheses indicate t-statistics; ***, **, and * denote statistical significance at 1%, 5%, and 10% level, respectively.
Source: Author's calculations

The results of the FMOLS cointegrating regressions with the dependent variable EG are shown in

Table 5.19. The results reject the hypothesis of no link from FDI to EG in both the constant (level) option and the constant (linear) and linear trend option in Models 10a and 10b. In Models 10b (ER and OT are added) and 10c (ER, OT, and POP are added), significant links from ER and OT to EG are found, but the POP-to-EG link is negative and insignificant (see Table 5.19). POP will not be included in the VEC models in Step 3.

Table 5.19 The FMOLS Cointegration Regressions (Model 10)

Cointegrating equation deterministic	Coefficient					
	Constant (level)			Constant (level) and Linear Trend		
Models	10a	10b	10c	10a	10b	10c
FDI	1.1014*** (5.3284)	0.1235** (2.5956)	0.0855 (1.3469)	0.1137** (2.1596)	0.1139** (2.6942)	0.0810 (1.5520)
ER		1.3442*** (3.6358)	1.4165*** (3.4710)		1.0363** (2.4764)	1.1063** (2.7836)
OT		0.5785*** (6.4852)	0.8669*** (3.0213)		0.3696** (2.6225)	0.6131** (2.7525)
POP			-3.8933 (-1.0600)			-4.2896 (-1.3949)
R-squared	0.638849	0.994804	0.994474	0.992935	0.995261	0.994979
Long-run variance	1.058011	0.008431	0.009862	0.026126	0.006526	0.005830

Note: GDP representing EG is the dependent variable; GDP, FDI, ER, OT, and POP are natural logarithm values; the total number of observations is 25 after adjustments (1991-2015); values in parentheses indicate t-statistics; *** and ** denote statistical significance at 1% and 5% levels, respectively.
Source: Author's calculations

Step 3: Investigate the causality direction between FDI and EG

In Step 3, the VEC models are employed to identify the causality direction between FDI and EG. The estimated results of VEC Models 11 and 13 are shown in Table 5.20. With only two endogenous variables (FDI and EG), no long-run bi-directional nexus between FDI and EG at Vietnam's national

Table 5.20 The Estimated Results of VEC Models 11 and 13 without Exogenous Variables

Model 11 - D(FDI)		Model 13 - D(GDP)	
Variable	Coefficient	Variable	Coefficient
c	-0.2966 (-0.9865)	c	0.0807* (2.0231)
ecm(FDI)	-0.5904*** (-2.8424)	ecm(GDP)	-0.0041 (-0.1779)
D[FDI(-1)]	0.3120 (1.3190)	D[FDI(-1)]	-0.0090 (-0.2867)
D[FDI(-2)]	0.3675 (1.6131)	D[FDI(-2)]	0.0024 (0.0794)
D[GDP(-1)]	0.7346 (0.3135)	D[GDP(-1)]	0.4062 (1.3064)
D[GDP(-2)]	1.0175 (0.8033)	D[GDP(-2)]	0.0448 (0.2663)

Note: GDP represents EG; FDI and GDP are natural logarithm values; values in parentheses indicate t-statistics; ecm(FDI) and ecm(GDP) are the error correction terms; the lag length is 2; the total number of observations is 23 after adjustments (1993-2015); D[FDI(−1)] and D[FDI(−2)] are the lag-1 and lag-2 first differential series of FDI, respectively; D[GDP(-1)]and D[GDP(−2)] are the lag-1 and lag-2 first differential series of GDP, respectively; *** and * indicate the null hypotheses that the coefficients of variables are equal to zero are rejected at 1% and 10% level, respectively.
Source: Author's calculations

level is found. The negative, significant ecm(FDI) (see Model 11, Table 5.20) shows that there is long-run causality running from EG to FDI. However, there is no long-run causality running from FDI to EG because of the negative, insignificant ecm(GDP) (see Model 13, Table 5.20).

In addition, the null hypotheses that the regression coefficients of D[GDP(−1)] and D[GDP(−2)] in Model 11, D[FDI(-1)] and D[FDI(-2)] in Model 13 are equal to zero are not rejected. This means that GDP is not Granger causal for FDI and FDI is not Granger causal for GDP in the short term in Vietnam (see Table 5.20). In other words, short-term changes of FDI and EG affect changes in EG and FDI marginally, respectively.

Table 5.21 The Estimated Results of VEC Models 12 and 14 with Exogenous Variables

Model 12 - D(FDI)		Model 14 - D(GDP)	
Variable	**Coefficient**	**Variable**	**Coefficient**
c	26.3779*** (2.8105)	c	4.1554* (2.0160)
ecm(FDI)	-0.4674*** (-5.5736)	ecm(GDP)	-0.0317 (-0.8358)
D[FDI(-1)]	-0.0779 (-0.6025)	D[FDI(-1)]	-0.0369 (-1.2973)
D[FDI(-2)]	-0.1628 (-1.2066)	D[FDI(-2)]	-0.0296 (-0.9997)
D[GDP(-1)]	-0.7467 (-0.6267)	D[GDP(-1)]	0.3624 (1.3849)
D[GDP(-2)]	1.6238** (2.3998)	D[GDP(-2)]	0.0570 (0.3836)
ER	-5.2553*** (-4.8965)	ER	-0.5844** (-2.4792)
OT	2.2161*** (9.0711)	OT	0.1440** (3.6834)

Note: GDP represents EG; FDI, GDP, ER, and OT are natural logarithm values; values in parentheses indicate t-statistics; ecm(FDI) and ecm(GDP) are the error correction terms; the lag length is 2; the total number of observations is 23 after adjustments (1993-2015); D[FDI(−1)] and D[FDI(−2)] are the lag-1 and lag-2 first differential series of FDI respectively; D[GDP(-1)]and D[GDP(−2)] are the lag-1 and lag-2 first differential series of GDP respectively; *, **, and *** indicate the null hypotheses that the coefficients of variables are equal to zero are rejected at 10%, 5%, and 1% significance level, respectively.
Source: Author's calculations

The estimated results of VEC Models 12 and 14 with the exogenous variables ER and OT are shown in Table 5.21. A long-run one-way relationship from EG to FDI is found in Vietnam. The ecm(FDI) has a negative, significant effect (see Model 12, Table 5.21), but ecm(GDP) is negative but insignificant (see Model 14, Table 5.21). In other words, the hypothesis of a long-term two-way nexus between FDI and EG in Vietnam is rejected.

In the short term, the null hypothesis that the regression coefficient D[GDP(-2)] is equal to zero is rejected (see Model 12, Table 5.21). This means that GDP is Granger causal for FDI in the second lag. However, FDI is not Granger causal for EG in the short term with insignificant coefficients of D[FDI(-1)] and D[FDI(-2)] in Model 14 (see Table 5.21). In terms of the exogenous variables, the results show that ER and OT exhibit significant effects on changes of both FDI and EG in the short term at the national level (see Models 12 and 14, Table 5.21).

In conclusion, the results show that there is long-term causality from EG to FDI and that EG is Granger causal for FDI in the short term as estimating the VEC models with the exogenous variables at the national level. However, long-term and short-term causality from FDI to EG at the national level from 1990 to 2015 is not found. Therefore, the hypothesis of a long-term two-way nexus between FDI and EG in Vietnam is not accepted. This result does not align with Srinivasan et al.'s (2010) findings that reveal the existence of a long-run two-way nexus between FDI and EG in Vietnam from 1991 to 2007. This is because the short-term and long-term changes of FDI may have had marginal effects on the EG changes in Vietnam from 1990 to 2015, which is similar to Wei and Li's (2011) findings of the less important role of FDI in promoting EG.

5.3.1.2 Impacts of FDI on EG

This section evaluates the impacts of FDI on EG at Vietnam's provincial, regional and national levels using the OLS estimation methods. The OLS estimations are employed at the national level, whereas the Panel OLS estimations are used at the regional and provincial levels.

Table 5.22 The FDI-to-EG Impact at the National Level

Without a time lag	Coefficient (Dependent variable: EG)	
Variable	**Model 15**	**Model 16**
c	-18.6788 (-0.5813)	-16.0628 (-0.4094)
FDI	0.1246*** (3.0230)	0.1839 (1.7703)
POP	1.1028 (0.3474)	0.0074 (0.0019)
ER	1.3600*** (5.8047)	2.6472* (2.5287)
OT	0.5087** (2.3558)	0.0755 (0.3300)
ICOR		-0.0432* (-2.0674)
INC		0.3464 (1.1704)
CPI		-0.0102 (-1.7940)
STATE		0.0011 (0.1578)
MKT		0.0038 (0.4667)
SCI		0.0315 (0.6469)
Adjusted R^2	0.995023	0.998701
F-statistic	1250.442***	1153.873***
Obs.	26 (1990 – 2015)	16 (2000 – 2015)

With a time lag	Coefficient (Dependent variable: EG)	
Variable	**Model 15**	**Model 16**
c	4.2400 (0.1446)	39.1410 (1.2489)
FDI(-1)	0.0596 (1.6904)	0.1384* (2.3926)
POP	-0.6377 (-0.2184)	-5.5588 (-1.7018)
ER	0.7903** (2.4677)	2.9963*** (4.9400)
OT	0.7687*** (4.0102)	-0.1221 (-0.5648)
ICOR		-0.0061 (-0.4956)
INC		1.0117** (3.7759)
CPI(-1)		-0.0037 (-1.1040)
STATE(-1)		0.0110 (1.1900)
MKT(-1)		0.0254** (3.0131)
SCI(-1)		0.1512** (3.3287)
Adjusted R^2	0.994409	0.999159
F-statistic	1068.193***	1664.369***
Obs.	25 (1991 – 2015)	15 (2001 – 2015)

Note: EG is the dependent variable; GDP represents EG; GDP, FDI, POP, ER, OT, and INC are natural logarithm values; values in parentheses indicate t-statistics; ***, **, and * denote statistical significance at 1%, 5%, and 10% level, respectively; Obs. stands for the number of observations.
Source: Author's calculations

According to Nguyen, Ho, et al. (2012), the impact of investments on EG has a time lag. In this study, the investment sources include FDI, STATE, MKT and SCI. The lag term in human capital (EDU), economic growth (RS), and inflation (CPI) is adapted from Escobari and Vacaflores (2014) and Nguyen, Ho, et al. (2012). Models 15 and 16 are first regressed without any time lag and then with a lag term in FDI, STATE, MKT, SCI and CPI to re-examine the FDI-to-EG link at the national level.

The empirical results of the FDI-to-EG impact at the national level without and with the time lag are reported in Table 5.22. A mixed result for the FDI-to-EG impact is reported without and with time lags. For example, FDI significantly, positively affects EG in Model 15 but the impact is insignificant in Model 16 (*without a time lag* in Table 5.22). The impact of FDI on EG *with a time lag* is insignificant in Model 15 but significant in Model 16.

At the regional and provincial levels, the results of the Hausman test show that cross-section random effect[31] models are appropriate. The empirical results of the FDI-to-EG link without and with a time lag are shown in Tables 5.23 and 5.24, respectively.

The regression results show that FDI significantly, positively affects EG at the regional level in Vietnam. This is because the null hypotheses that the coefficients of FDI are equal to zero are all rejected in Models 17 and 18.

At the provincial level, the mixed results of the effect of FDI on EG are reported in Tables 5.23 and 5.24. The coefficients of FDI in Model 19 are positive and significant, which confirms the result of FDI-to-EG causality at the provincial level in Tables 5.12 and 5.13. However, FDI negatively and insignificantly impacts EG in Model 20 (see Tables 5.23 and 5.24). POP, ER, ICOR, INC, and CPI exhibit significant effects on EG at the regional and provincial levels without and with a time lag (see Tables 5.23 and 5.24).

Table 5.23 The FDI-to-EG Impact without a Time Lag at Vietnam's Regional and Provincial Levels

Variable	Model (Dependent variable: EG)			
	Regional level		Provincial level	
	17	18	19	20
c	-51.4915***(-22.1287)	-35.3982*** (-12.7074)	-54.8164*** (-69.8800)	-39.4626*** (-36.2104)
FDI	0.1390*** (9.0059)	0.0514*** (3.1917)	0.0361*** (6.6713)	-0.0037 (-0.8952)
POP	1.5579*** (5.2899)	1.0607*** (6.4728)	1.1898*** (14.0388)	0.9655*** (15.8682)
ER	4.8606*** (26.4810)	3.2419*** (11.3637)	5.6617*** (78.2808)	3.6630*** (33.0198)
ICOR				0.0178* (1.7729)
INC		0.4854*** (7.4084)		0.4999*** (21.5018)
CPI		0.0121*** (4.4480)		0.0194*** (10.4129)
Adjusted R^2	0.965812	0.976781	0.919544	0.955917
F-statistic	895.5764***	800.3122***	3654.497***	3466.912***
Periods	16 (2000 - 2015)	16 (2000 - 2015)	16 (2000 - 2015)	16 (2000 - 2015)
Cross-sections	6	6	60	60
Obs.	96	96	960	960

Note: EG is the dependent variable; RS represents EG; RS, FDI, POP, ER, and INC are natural logarithm values; values in parentheses indicate t-statistics; *** and * denote statistical significance at 1% and 10% level, respectively; Obs. stands for the number of observations.
Source: Author's calculations

[31] The cross-section random effect models are regressed with selections of cross-section: random; period: none; weight: no weights; and coef. covariance method: OLS.

The scatterplots of FDI and RS at the provincial level in Vietnam by regions (see Figure 5.3) show different FDI-to-EG impacts in different regions. Unbalanced provincial and regional economic development and the effects of policies and laws in areas under different socio-economic conditions

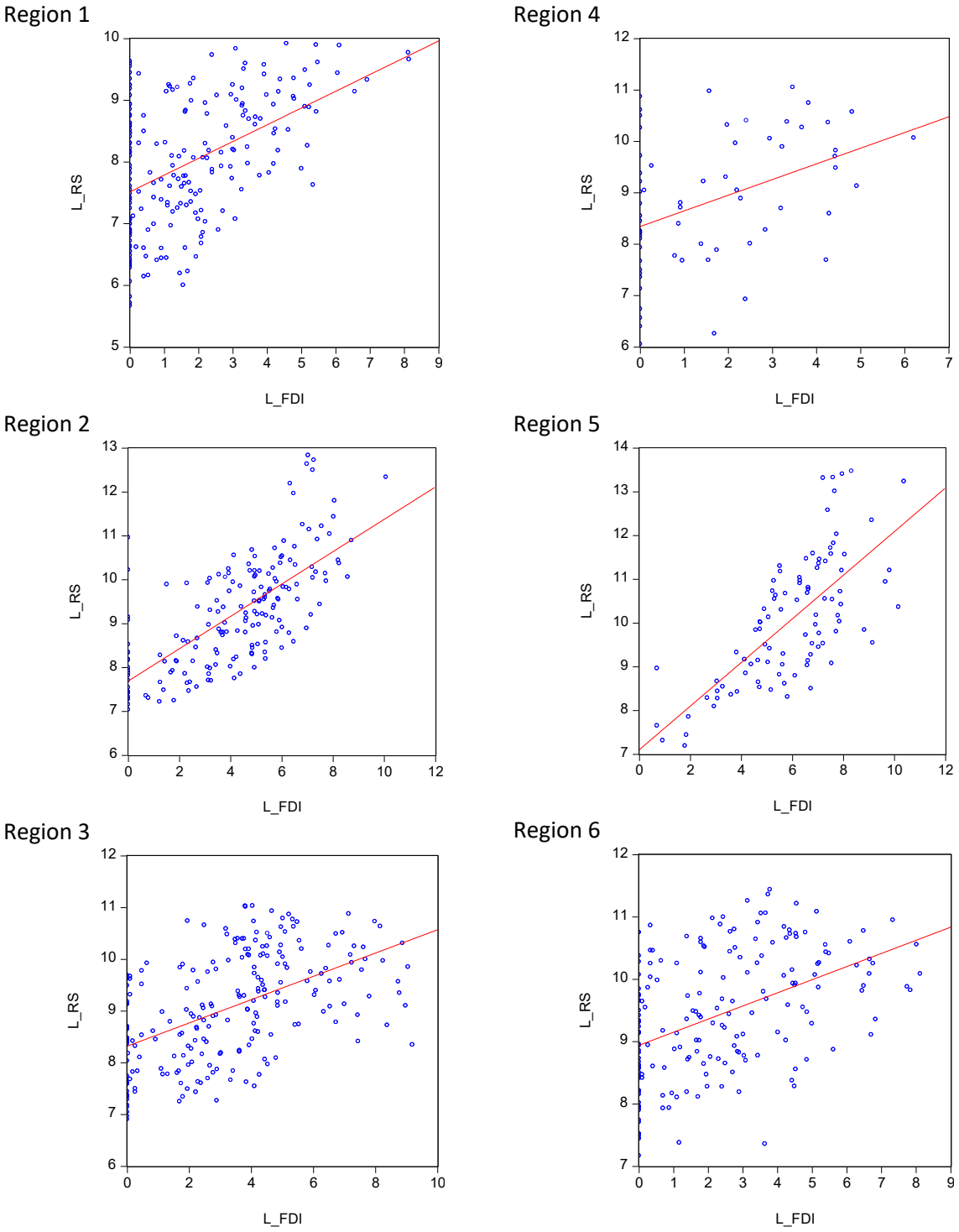
Table 5.24 The FDI-to-EG Impact with a Time Lag at Vietnam's Regional and Provincial Levels

Variables	Model (Dependent variable: EG)			
	Regional level		Provincial level	
	17	18	19	20
c	-50.3758*** (-19.7214)	-32.7275*** (-11.0228)	-53.6179*** (-63.6241)	-37.2766*** (-35.1295)
FDI(-1)	0.1393*** (8.5232)	0.0765*** (4.8175)	0.0345*** (6.1348)	-0.0067 (-1.5174)
POP	1.7056*** (5.4427)	1.0846*** (6.0019)	1.2197*** (14.0882)	1.0367*** (16.6703)
ER	4.6066*** (23.3086)	2.9859*** (10.3117)	5.5198*** (71.2382)	3.4828*** (31.2558)
ICOR				-0.0384*** (-5.0326)
INC		0.4734*** (7.1919)		0.5250*** (20.9695)
CPI(-1)		0.0080** (2.5684)		0.0106*** (6.8441)
Adjusted R^2	0.960937	0.973769	0.911506	0.949193
F-statistic	730.7806***	661.7920***	3087.630***	2800.231***
Periods	15 (2001 - 2015)	15 (2001 - 2015)	15 (2001 - 2015)	15 (2001 - 2015)
Cross-sections	6	6	60	60
Obs.	90	90	900	900

Note: EG is the dependent variable; RS represents EG; RS, FDI, POP, ER, and INC are natural logarithm values; values in parentheses indicate t-statistics; *** and ** denote statistical significance at 1% and 5% level, respectively; Obs. stands for the number of observations.
Source: Author's calculations

can cause the different effects of FDI in Vietnam. Therefore, the scatterplots of FDI and RS with the regression line and the Kernel Fit line are drawn for two areas (see Figures 5.4 and 5.5). The first area includes five city administrative units (Hanoi, Hai Phong, Da Nang, Ho Chi Minh city and Can Tho), and the second area includes five provinces under the extremely difficult socio-economic conditions[32] (Bac Kan, Lao Cai, Lai Chau, Gia Lai, and Kon Tum). Figure 5.4 shows a positive, strong relationship between FDI and RS for the five cities, but the relationship is fairly weak for the five provinces under the extremely difficult conditions (see Figure 5.5).

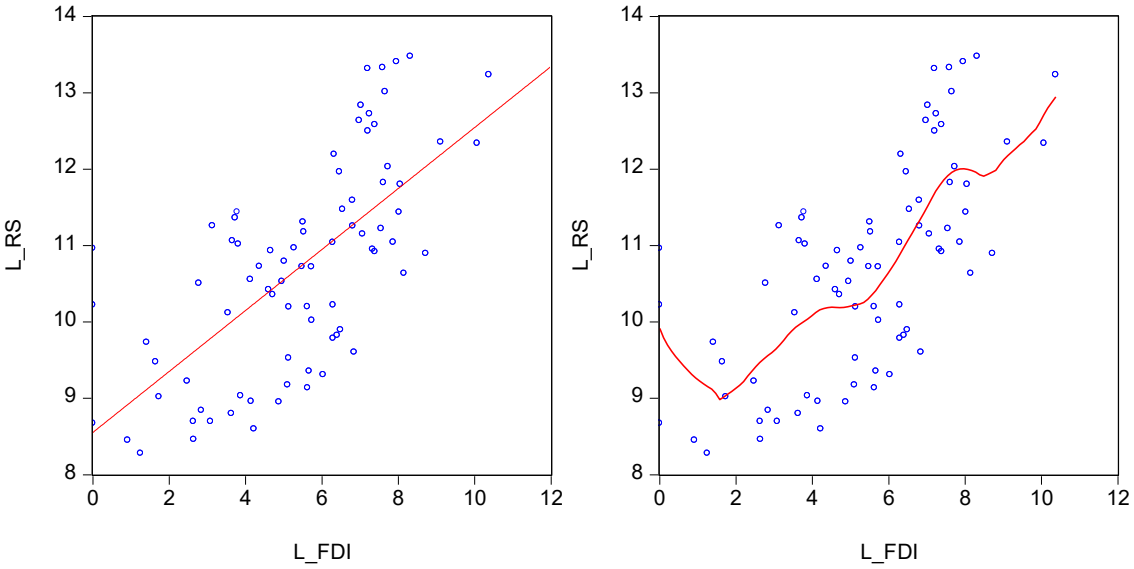
[32] Bac Kan, Lao Cai, Lai Chau, Gia Lai, and Kon Tum were under the extremely difficult socio-economic conditions (PR=2) over 2000-2015.



Note: The scatterplots are stack cross sections with the regression lines (in red).
L_RS and L_FDI indicate that RS and FDI are natural logarithm values.
Region 1 is the Northern Midlands and Mountain Areas
Region 2 is the Red River Delta
Region 3 is the North Central and Central Coastal Areas
Region 4 is the Central Highlands
Region 5 the South East
Region 6 is the Mekong River Delta

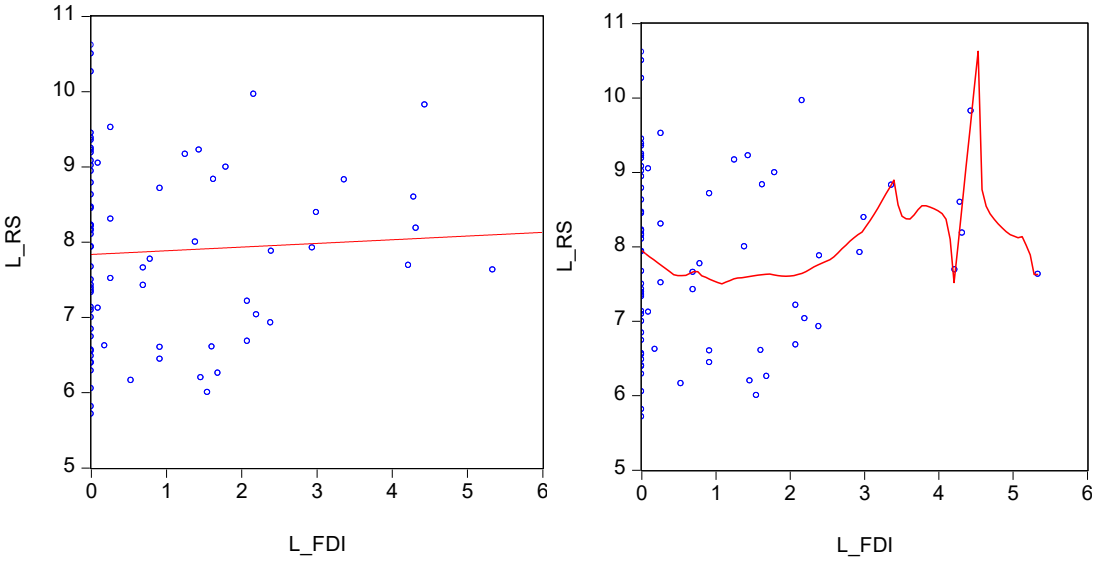
Source: Author's calculations

Figure 5.3 Scatterplots of FDI and RS at the Provincial Level by Region in Vietnam



Note: The scatterplots are stack cross sections with the regression line (left) and the Kernel Fit line (right). L_RS and L_FDI indicate that RS and FDI are natural logarithm values.
Source: Author's calculations

Figure 5.4 Scatterplots of FDI and RS for Five Cities in Vietnam



Note: The scatterplots are stack cross sections with the regression line (left) and the Kernel Fit line (right). L_RS and L_FDI indicate that RS and FDI are natural logarithm values.
Source: Author's calculations

Figure 5.5 Scatterplots of FDI and RS for the Vietnam Provinces under Extremely Difficult Socio-economic Conditions

5.3.1.3 Impacts of EG on FDI

In terms of $H_{1.3}$, *the EG-to-FDI link* is examined at the national level using regression Models 21, 22, and 23. The results are reported in Tables 5.25 and 5.26. Table 5.25 shows the inconsistent results for

Table 5.25 The EG-to-FDI Impact without a Time Lag at the Vietnam National Level

	Coefficient (Dependent variable: FDI)		
Variable	**Model 21** (1990-2015)	**Model 22** (1995-2015)	**Model 23** (2000-2015)
c	32.9050*** (4.4444)	77.8784*** (12.2080)	92.2913 (1.2050)
EG	3.0036*** (3.4488)	2.1018* (1.9446)	2.1958 (1.3297)
ER	-5.4651*** (-4.2801)	-11.2815*** (-8.1351)	-11.7493*** (-6.0775)
OT	-1.0943* (-1.7387)	0.8066 (1.2843)	1.1727 (1.0849)
ICOR		0.1342* (2.3516)	0.1517* (2.2841)
INC		0.0474 (0.0544)	-0.3622 (-0.2914)
CPI		0.0422** (2.9363)	0.0421* (2.6232)
STATE		-0.0169 (-0.8060)	-0.0102 (-0.4504)
MKT		-0.0488*** (-3.8563)	-0.0540* (-2.3106)
SCI		-0.2768** (-2.7231)	-0.3480** (-2.6559)
LF			-1.1945 (-0.1619)
EDU			0.0270 (1.0610)
Adjusted R^2	0.814651	0.991898	0.991277
F-statistic	37.62693***	205.0506***	155.9557***
Obs.	26	16	16

Note: FDI is the dependent variable; GDP represents EG; FDI, GDP, ER, OT, INC, and LF are natural logarithm values; values in parentheses indicate t-statistics; ***, **, and * denote statistical significance at 1%, 5%, and 10% level, respectively; Obs. stands for the number of observations.
Source: Author's calculations

the EG-to-FDI link at the national level without a lag term in EG, STATE, MKT, SCI, CPI and EDU. EG positively affects FDI at 1% and 10% significance level in Models 21 and 22, respectively (see Table 5.25). However, the relationship is insignificant in Model 23 (see Table 5.25).

Table 5.26 reports the results of the EG-to-FDI relationship with a lag term in EG, STATE, MKT, SCI, CPI and EDU adapted from Escobari and Vacaflores (2014) and Nguyen, Ho, et al. (2012). The results show the mixed effects of EG on FDI attraction at the national level in Vietnam from 2000 to 2015. The coefficient of EG(-1) is negative and insignificant in Model 21, but positive and significant at the 10% level in Models 22 and 23 (see Table 5.26).

Table 5.26 The EG-to-FDI Impact with a Time Lag at the Vietnam National Level

	Coefficient (Dependent variable: FDI)		
Variable	**Model 21** (1990-2015)	**Model 22** (1995-2015)	**Model 23** (2000-2015)
c	46.3212*** (5.1552)	97.5056*** (6.5964)	178.5945 (2.2589)
EG(-1)	-0.1828 (-0.2931)	4.2928* (2.4387)	5.4770* (3.1039)
ER	-5.6114*** (-4.7036)	-13.1117*** (-4.6566)	-14.3798** (-5.3192)
OT	1.7712*** (3.0933)	2.2475 (1.4956)	0.9962 (0.6369)
ICOR		-0.1605* (-2.0865)	-0.2296* (-2.5820)
INC		-4.5706 (-1.5199)	-3.8472 (-1.2903)
CPI(-1)		-0.0404 (-1.9886)	-0.0594* (-2.6630)
STATE(-1)		-0.0924*** (-4.2689)	-0.1082** (-4.3860)
MKT(-1)		-0.0546* (-2.2088)	-0.0459 (-1.8276)
SCI(-1)		0.2489 (1.1146)	0.1185 (0.5075)
LF			-6.9538 (-0.9133)
EDU(-1)			0.0654 (1.6766)
Adjusted R^2	0.828849	0.980027	0.983072
F-statistic	39.74225***	77.3265***	74.91399***
Obs.	25	15	15

Note: FDI is the dependent variable; GDP represents EG; FDI, GDP, ER, OT, INC, and LF are natural logarithm values; values in parentheses indicate t-statistics; ***, **, and * indicate significance at 1%, 5%, and 10% level, respectively; Obs. stands for the number of observations.
Source: Author's calculations

Tables 5.25 and 5.26 show the high adjusted R^2 values with several significant variables in Model 23 compared with Models 21 and 22. The higher number of regressors in Model 23 may lead to the higher value of adjusted R^2. The different study periods of the estimations (1990-2015 in Model 21, 1995-2015 in Model 22, and 2000-2015 in Model 23) may be a possible reason for the different estimation results (see Table 5.26).

Table 5.27 The EG-to-FDI Impact without a Time Lag at Vietnam's Regional and Provincial Levels

Variable	Model (Dependent variable: FDI)			
	Regional level		**Provincial level**	
	24	**25**	**26**	**27**
c	69.8601*** (4.3546)	57.9931***(3.0688)	-4.0617 (-0.5188)	-43.7352*** (-4.9191)
EG	2.2806*** (6.6711)	1.4546*** (3.2250)	1.1222*** (8.2560)	0.5372*** (3.3834)
EDU	0.0404* (1.7659)	0.0207 (0.8619)	0.0049*** (4.0450)	0.0035*** (3.1063)
ER	-9.2872*** (-4.6534)	-8.3739*** (-3.7104)	-0.3154 (-0.3446)	2.9625*** (2.9739)
ICOR				0.1449* (1.8405)
INC		0.9743** (2.0285)		-0.0382 (-0.1866)
CPI		0.0513*** (2.9781)		0.1195*** (8.4411)
Adjusted R^2	0.653781	0.687300	0.315660	0.393011
F-statistic	60.79755***	42.76118***	148.4501***	104.4884***
Periods	16 (2000 - 2015)	16 (2000 - 2015)	16 (2000 - 2015)	16 (2000 - 2015)
Cross-sections	6	6	60	60
Obs.	96	96	960	960

Note: EG is the dependent variable; RS represents EG; FDI, RS, ER, and INC are natural logarithm values; values in parentheses indicate t-statistics; ***, **, and * indicate significance at 1%, 5%, and 10% level, respectively; Obs. stands for the number of observations.
Source: Author's calculations

Table 5.28 The EG-to-FDI Impact with a Time Lag at Vietnam's Regional and Provincial Levels

Variable	Model (Dependent variable: FDI)			
	Regional level		Provincial level	
	24	25	26	27
c	76.1956*** (4.2971)	78.1236*** (3.9393)	-4.2103 (-0.4880)	-2.1113 (-0.2290)
EG(-1)	2.0217*** (5.3997)	1.6685*** (3.5094)	0.9888*** (6.6717)	0.8805*** (5.2638)
EDU(-1)	0.0598** (2.5990)	0.0513** (2.0748)	0.0037*** (2.8715)	0.0027** (2.1574)
ER	-9.6128*** (-4.3647)	-9.9844*** (-4.1505)	-0.1516 (-0.1509)	0.0138 (0.0129)
ICOR				-0.5003*** (-8.0058)
INC		0.5879 (1.1761)		0.2784 (1.2320)
CPI(-1)		0.0133 (0.7541)		-0.0310** (-2.5475)
Adjusted R^2	0.585883	0.586294	0.249691	0.301487
F-statistic	42.97167***	26.22573***	100.7244***	65.67004***
Periods	15 (2001 - 2015)	15 (2001 - 2015)	15 (2001 - 2015)	15 (2001 - 2015)
Cross-sections	6	6	60	60
Obs.	90	90	900	900

Note: EG is the dependent variable; RS represents EG; FDI, RS, ER, and INC are natural logarithm values; values in parentheses indicate t-statistics; *** and ** indicate significance at 1% and 5% level, respectively; Obs. stands for the number of observations.
Source: Author's calculations

At the regional and provincial levels, the EG-to-FDI link is investigated using Models 24-27 (see Table 4.11). The results of the Hausman test show that cross-section random effect models[33] are appropriate. The consistent results of a significant, positive effect of EG on FDI at the 1% level are shown in Tables 5.27 and 5.28 (without and with a lag term in EG, EDU, and CPI, respectively).

Table 5.29 A Summary of the Relationships between FDI and EG in Vietnam

No.	Hypotheses	Findings		
		National	Regional	Provincial
$H_{1.1}$	There is a strong long-term bi-directional link between FDI and EG in Vietnam	No	-	Yes
$H_{1.2}$	FDI significantly, positively affects EG at the provincial, regional, and national levels in Vietnam	No	Yes	Mixed
$H_{1.3}$	EG significantly, positively affects FDI attraction at the provincial, regional and national levels in Vietnam	Mixed	Yes	Yes

Q1. ***What is the relationship between FDI and EG in the provinces and cities of Vietnam?***

1. At the national level, there is no two-way nexus between FDI and EG.
2. At the regional level, there is a bi-directional positive nexus between FDI and EG.
3. At the provincial level, there is/are:
   i. a long-term bi-directional positive relationship between FDI and EG;
   ii. mixed results for the FDI-to-EG impact; and
   iii. a positive link from EG to FDI.

In conclusion, the two-way nexus between FDI and EG does not exist at the national level. At the provincial level, there is a long-term bi-directional link between FDI and EG. However, the findings on

[33] The cross-section random effect models are regressed with selections of cross-section: random; period: none; weight: no weights; and coef. covariance method: OLS.

the effects of FDI on EG and EG on FDI at the provincial level are mixed. At the regional level, a bi-directional relationship between FDI and EG exists. The findings are summarised in Table 5.29.

5.3.2 FDI Provincial Competition and the Effects of Policies

The results of the PCI-based and IIP-based competition in FDI attraction at the provincial level in Vietnam are shown in Table 5.30 (without a time lag) and Table 5.31 (with a lag term in EG, EDU and CPI[34]). The Hausman test confirms the random effects model is appropriate.

PCI-based Competition in FDI Attraction

The coefficient of PCI is positive and significant at 1% level (see Models 28 and 30 in Tables 5.30 and 5.31). Therefore, $H_{2.1}$ cannot be rejected because provinces and cities with better governance are strongly associated with FDI attraction. In other words, foreign investors are more likely to invest in Vietnam provinces and cities with better governance (higher PCI).

Table 5.30 The Vietnam FDI Provincial Competition and the Effects of Policies without a Time Lag

	Model (Dependent variable: FDI)		
Variable	**28**	**29**	**30**
c	-40.4238*** (-3.9760)	-25.9559** (-2.3564)	-40.1546*** (-4.0143)
EG	0.7753*** (3.8300)	0.9513*** (5.0188)	0.7753*** (3.9856)
EDU	0.0033*** (2.6452)	0.0033*** (2.7564)	0.0033*** (2.6837)
ER	2.1245* (1.8078)	0.5494 (0.4347)	2.1412* (1.8413)
ICOR	0.1258 (1.3441)	0.0680 (0.6497)	0.1479 (1.5449)
INC	-0.1247 (-0.4204)	-0.1042 (-0.3431)	-0.1080 (-0.3661)
CPI	0.1299*** (7.8729)	0.1312*** (6.7728)	0.1269*** (7.6949)
PCI	0.0396*** (2.6749)		0.0404*** (2.7575)
ENTRY		0.2188*** (2.9260)	
LAND		-0.2311** (-2.4528)	
ACCESS		0.1025 (1.0859)	
TIME		0.0082 (0.1132)	
CHARGE		-0.0315 (-0.3598)	
PROACT		0.0580 (0.8405)	
SUPPORT		-0.1285** (-2.2172)	
LABOUR		0.1194* (1.7286)	
LEGAL		0.0970 (1.5605)	
IIP			-0.6101 (-1.3836)
Adjusted R^2	0.244086	0.259649	0.247994
F-statistic	31.39887***	16.40789***	28.16539***
Periods	11 (2005-2015)	11 (2005-2015)	11 (2005-2015)
Cross-sections	60	60	60
Obs.	660	660	660

Note: The random effects models are appropriate; FDI is the dependent variable; RS represents EG; FDI, RS, ER, and INC are natural logarithm values; values in parentheses indicate t-statistics; ***, **, and * denote statistical significance at 1%, 5%, and 10% level, respectively; Obs. stands for the number of observations.
Source: Author's calculations

[34] The lag term in EG, EDU and CPI is adapted from Escobari and Vacaflores (2014) and Nguyen, Ho, et al. (2012).

However, Nguyen, Ho, et al. (2012) argue that better governance was not strongly associated with higher FDI in Vietnam. Therefore, the effects of the nine PCI sub-indices on FDI at the provincial level are investigated using Model 29. The results in Tables 5.30 and 5.31 show only one sub-index (ENTRY) consistently exhibits a positive, significant effect (at the 1% level) on FDI attraction at the provincial level. This implies lower entry costs to start a business are more likely to improve FDI provincial competition. The coefficient of ENTRY in the model with a lag term (0.4196 in Table 5.31) is nearly double that in the model without a lag term (0.2188 in Table 5.30). This means ENTRY is more likely to be an important PCI sub-index contributing to better governance (higher PCI) and is strongly associated with higher FDI at the provincial level in Vietnam from 2005 to 2015.

Table 5.31 The Vietnam FDI Provincial Competition and the Effect of Policies with a Time Lag

	Model (Dependent variable: FDI)		
Variable	**28**	**29**	**30**
c	3.0588 (0.2999)	16.2228 (1.4367)	-0.4330 (-0.0432)
EG(-1)	0.9647*** (4.7304)	1.0244*** (5.3854)	0.8687*** (4.4264)
EDU(-1)	0.0029** (2.1143)	0.0027** (2.1170)	0.0028** (2.0909)
ER	-0.7237 (-0.5889)	-1.7363 (-1.3236)	-0.1199 (-0.0984)
ICOR	-0.5370*** (-7.1022)	-0.5990*** (-7.5355)	-0.4707*** (-5.9669)
INC	0.1448 (0.4610)	-0.1066 (-0.3435)	0.1763 (0.5638)
CPI(-1)	-0.0388*** (-2.8601)	-0.0688*** (-4.6887)	-0.0494*** (-3.5361)
PCI	0.0581*** (3.7001)		0.0586*** (3.7627)
ENTRY		0.4196*** (5.2443)	
LAND		-0.1278 (-1.3141)	
ACCESS		0.2924*** (3.1328)	
TIME		0.1152 (1.5753)	
CHARGE		0.0810 (0.9196)	
PROACT		-0.0392 (-0.5639)	
SUPPORT		-0.0775 (-1.3265)	
LABOUR		-0.0850 (-1.2241)	
LEGAL		0.1339 ** (2.1165)	
IIP			-1.4448*** (-3.0538)
Adjusted R^2	0.1802	0.2281	0.196351
F-statistic	21.6973***	13.9833***	21.12621***
Periods	11 (2005-2015)	11 (2005-2015)	11 (2005-2015)
Cross-sections	60	60	60
Obs.	660	660	660

Note: The random effects models are appropriate; FDI is the dependent variable; RS represents EG; FDI, RS, ER, and INC are natural logarithm values; values in parentheses indicate t-statistics; ***, **, and * denote statistical significance at 1%, 5%, and 10% level, respectively; Obs. stands for the number of observations.
Source: Author's calculations

The results on the effects of other PCI sub-indices such as LAND, SUPPORT, LABOUR, ACCESS and LEGAL on FDI attraction are mixed. The coefficients of LAND and SUPPORT are negative (see Tables 5.30 and 5.31), and significant only at the 5% level without a lag term (see Table 5.30). LABOUR affects FDI positively and significantly at the 10% level without a lag term (see Table 5.30), but the

effect is negative and insignificant with a lag term (see Table 5.31). The coefficients of ACCESS and LEGAL are positive and significant at 5% level with a lag term in EG, EDU and CPI (see Table 5.31).

The results in Tables 5.30 and 5.31 imply that lower entry costs to start a business (ENTRY), easy access to information (ACCESS), and fairer and more effective legal processes for dispute resolution (LEGAL) are more likely to increase the FDI provincial competition. The three sub-indices (ENTRY, ACCESS, and LEGAL) contribute to the positive, significant coefficient of PCI in Models 28 and 30 (Tables 5.30 and 5.31). However, the mixed results of LAND, SUPPORT and LABOUR, and the insignificant coefficients of TIME, CHARGE and PROACT support the argument of a negative relationship between governance and FDI in the Nguyen, Ho, et al.'s (2012) study. This means that the ability to access land (LAND), the time required for bureaucratic procedures and inspections (TIME), informal charges (CHARGE), proactive and creative provincial leadership (PROACT), business support services (SUPPORT), and labour training policies (LABOUR) are less likely to determine investors' decisions about where to locate their capital in Vietnam.

IIP-based Competition in FDI Attraction

The coefficients of IIP are negative (see Tables 5.30 and 5.31) and significant at 1% level with a lag term in EG, EDU and CPI. Therefore, $H_{2.2}$ cannot be rejected, which means our findings do not conform to Thomas's (2009) and Vu et al.'s (2009) results that more investment incentives attract more FDI. In other words, offering free land, income tax and import tax exemption is less likely to attract more FDI at the provincial level in Vietnam over 2000-2015.

Table 5.32 A Summary of the PCI-based and IIP-based competition in FDI attraction for Vietnam

No.	Hypotheses	Finding		
		PCI	**PCI sub- indices**	**IIP**
$H_{2.1}$	Provinces with better governance are strongly associated with registered FDI.	Yes	Mixed	-
$H_{2.2}$	Provinces offering higher fiscal incentives attract less FDI.	-	-	Yes

Q2. ***How does PCI-based and IIP-based competition affect FDI at the provincial level in Vietnam?***

1. PCI-based competition over 2005-2015 shows:
    i. Provinces with better governance (higher PCI) are strongly associated with registered FDI.
    ii. Three PCI sub-indices (ENTRY, ACCESS, and LEGAL) are more likely to determine investors' decisions where to locate their capital in Vietnam than other sub-indices (LAND, TIME, CHARGE, PROACT, SUPPORT, and LABOUR).
2. IIP-based competition over 2000-2015 shows: Provinces offering higher fiscal incentives (higher IIP index) attract less FDI in Vietnam.

In conclusion, $H_{2.1}$ and $H_{2.2}$ cannot be rejected. This implies that there is PCI-based and IIP-based competition in FDI attraction at the provincial level in Vietnam. Provinces and cities with higher PCI (better governance) attract more FDI, which aligns with Nguyen and Ho's (2013) and Malesky's (2010) studies. However, the PCI sub-indices differently affect the FDI provincial competition, and not all PCI sub-indices significantly affect FDI in Vietnam (see Table 5.32), which explains the weak PCI - FDI link found in Nguyen, Ho, et al. (2012) and Nguyen and Nguyen (2007) studies. In addition, provinces offering higher fiscal incentives (a higher IIP index) attract less FDI, which aligns with the Vu's (2007) conclusion on the negative effect of incentives on FDI flows in Vietnam. Table 5.32 summarises the PCI-based and IIP-based competition in FDI attraction at the provincial level in Vietnam.

5.3.3 The Effects of Laws on FDI

This section reports the effects of laws on FDI at Vietnam's national, regional and provincial levels in Tables 5.33 - 5.40. At the national level, Table 5.33 shows that the new investment and enterprise laws in 2005 (LAW) and participation in WTO and FTAs by Vietnam insignificantly affected FDI attraction without and with a lag term in EG, EDU, CPI, and STATE. The insignificant effect of WTO on FDI at the national level does not align with the findings of Nguyen, Zhang, et al. (2012) and Pham (2011). This may be because the study period after Vietnam joined the WTO (eight years from 2008 to 2015) is longer than the study periods in the previous studies.

At regional level, the results of the Hausman test show that fixed effect models are appropriate. The results of insignificant coefficients for LAW, WTO, FTA, and their interaction terms with RR and RR2 are reported in Tables 5.34 and 5.35. They imply that the law changes were less likely to affect FDI attraction at the regional level; the effects are not different among the six regions ranked differently in Vietnam over 2000-2015. In Models 33a-c and 34a-c (see the Tables 5.34 and 5.35), the adjusted R^2 values are high with few significant variables identified. The possible reason to explain this is that using the fixed effect model may show impacts of only variables that vary over time, and omit time-invariant characteristics of regions such as geography and culture.

Table 5.33 The Effects of Laws on FDI at the Vietnam National Level

Without a time lag	Coefficient (Dependent variable: FDI)	
Variable	**Model 31**	**Model 32**
c	75.1309*** (3.4588)	84.6961** (2.7579)
EG	6.1875** (2.2825)	4.7393 (1.4830)
EDU	-0.0186 (-0.4338)	-0.0276 (-0.5856)
ER	-12.7662** (-3.1670)	-12.5604** (-2.8236)
ICOR	0.1979 (1.8322)	0.1378 (1.0792)
INC	-3.8705 (-1.4662)	-2.6935 (-0.8976)
CPI	0.0300 (1.0791)	0.0240 (0.7944)
STATE	-0.0424 (-1.2741)	-0.0402 (-0.9726)
LAW	-0.2003 (-0.4627)	-0.1092 (-0.2331)
WTO		0.1702 (0.4378)
FTA		0.1016 (0.5459)
Adjusted R^2	0.957202	0.952199
F-statistic	45.73138***	32.87191***
Obs.	17 (1999-2015)	17 (1999-2015)

With a time lag	Coefficient (Dependent variable: FDI)	
Variable	**Model 31**	**Model 32**
c	104.4300*** (5.5693)	139.4970*** (4.2405)
EG(-1)	3.7806 (1.7521)	2.7420 (1.3832)
EDU(-1)	0.0713 (1.3721)	0.0702 (1.5206)
ER	-12.1974*** (-3.6891)	-15.5191** (-3.7584)
ICOR	-0.1535 (-1.4116)	-0.1410 (-1.4483)
INC	-2.2795 (-0.9698)	-1.2694 (-0.5904)
CPI(-1)	-0.0627** (-2.8349)	-0.0493* (-2.3642)
STATE(-1)	-0.1085** (-3.4050)	-0.0811* (-2.5009)
LAW	-0.4102 (-1.1832)	-0.4476 (-1.2898)
WTO		0.0179 (0.0517)
FTA		0.2658 (1.4884)
Adjusted R^2	0.948167	0.959317
F-statistic	35.29921***	36.37074***
Obs.	16 (2000-2015)	16 (2000-2015)

Note: FDI is the dependent variable; GDP represents EG; FDI, GDP, ER, and INC are natural logarithm values; values in parentheses indicate t-statistics; ***, **, and * denote statistical significance at 1%, 5%, and 10% level, respectively; Obs. stands for the number of observations.
Source: Author's calculations

Table 5.34 The Effects of the New Laws on FDI at the Vietnam Regional Level

Without a time lag	Coefficient (Dependent variable: FDI)		
Variable	**Model 33a**	**Model 33b**	**Model 33c**
c	26.0971 (0.8987)	25.7311 (0.8805)	23.9747 (0.8155)
EG	0.5308 (0.6497)	0.4790 (0.5710)	0.4227 (0.4965)
EDU	0.0116 (0.3776)	0.0186 (0.4827)	0.0140 (0.3668)
ER	-4.7238 (-1.3366)	-4.6351 (-1.2998)	-4.3491 (-1.2116)
ICOR	0.2288 (1.4846)	0.2338 (1.5000)	0.2188 (1.4096)
INC	1.2074* (1.9019)	1.2269* (1.9123)	1.2188 (1.4096)
CPI	0.0883*** (2.9957)	0.0886*** (2.9858)	0.0868*** (2.9384)
RR	0.2164 (1.1665)	0.0837 (0.1762)	
RR2			0.1233 (0.2568)
LAW	0.6430 (1.3428)	0.4084 (0.4489)	0.4590 (0.8048)
LAW*RR		0.1510 (0.3039)	
LAW*RR2			0.3031 (0.5447)
Adjusted R^2	0.859231	0.857656	0.857439
F-statistic	45.60500***	41.88536***	41.81295***
Periods	16 (2000-2015)	16 (2000-2015)	16 (2000-2015)
Cross-sections	6	6	6
Obs.	96	96	96

With a time lag	Coefficient (Dependent variable: FDI)		
Variable	**Model 33a**	**Model 33b**	**Model 33c**
c	87.3881*** (2.8676)	86.1363*** (2.8008)	84.2445*** (2.7286)
EG(-1)	1.9237** (2.2270)	1.8185** (2.0255)	1.7426* (1.9275)
EDU(-1)	0.0520 (1.6536)	0.0646 (1.5449)	0.0645 (1.5721)
ER	-10.6172*** (-2.7719)	-10.3749*** (-2.6698)	-10.1435** (-2.6021)
ICOR	-0.1739 (-1.4686)	-0.1636 (-1.3511)	-0.1646 (-1.3649)
INC	0.2928 (0.4406)	0.3158 (0.4714)	0.3560 (0.5345)
CPI(-1)	-0.0206 (-0.9385)	-0.020 (-0.9211)	-0.0205 (-0.9308)
RR	0.0517 (0.2652)	-0.1790 (-0.3327)	
RR2			-0.1386 (-0.2561)
LAW	0.4623 (0.9694)	0.0650 (0.0658)	0.2397 (0.4122)
LAW*RR		0.2605 (0.4605)	
LAW*RR2			0.4079 (0.6571)
Adjusted R^2	0.842846	0.841199	0.841885
F-statistic	37.71708***	34.67504***	34.84864***
Periods	15 (2001-2015)	15 (2001-2015)	15 (2001-2015)
Cross-sections	6	6	6
Obs.	90	90	90

Note: The fixed effects models are appropriate; FDI is the dependent variable; GDP represents EG; FDI, GDP, ER, and INC are natural logarithm values; values in parentheses indicate t-statistics; ***, **, and * denote statistical significance at 1%, 5%, and 10% level, respectively; Obs. stands for the number of observations.
Source: Author's calculations

Table 5.35 The Effects of the WTO and FTA Membership on FDI at the Vietnam Regional Level

Without a time lag	Coefficient (Dependent variable: FDI)		
Variable	**Model 34a**	**Model 34b**	**Model 34c**
c	99.8506** (2.2852)	85.9306* (1.9557)	91.0927* (2.0871)
EG	1.0089 (1.2836)	-0.2198 (-0.2148)	-0.0543 (-0.0543)
EDU	0.0230 (0.7508)	0.0363 (1.1475)	0.0399 (1.1455)
ER	-13.0028*** (-2.7521)	-10.8068** (-2.2394)	-11.5103* (-2.4235)
ICOR	0.1811 (1.0997)	0.1628 (0.9959)	0.1715 (1.044354)
INC	1.2168* (1.8977)	2.0748** (2.5761)	1.9906* (2.4552)
CPI	0.0913*** (2.7567)	0.0963*** (2.9240)	0.0976*** (2.9419)
RR	0.2020 (1.0821)	-0.3591 (-1.0238)	
RR2			-0.4871 (-0.8918)
WTO	-0.5841 (-0.9564)	-0.5503 (-0.7270)	-0.5965 (-0.8228)
FTA	0.3693 (1.3719)	0.2944 (1.0663)	0.3234 (1.1794)
WTO*RR		0.0449 (0.1129)	
FTA*RR		0.0951 (1.3397)	
WTO*RR2			0.0702 (0.0939)
FTA*RR2			0.1634 (1.1546)
Adjusted R^2	0.857729	0.860391	0.859492
F-statistic	41.91000***	37.59198***	37.32003***
Periods	16 (2000-2015)	16 (2000-2015)	16 (2000-2015)
Cross-sections	6	6	6
Obs.	96	96	96

With a time lag	Coefficient (Dependent variable: FDI)		
Variable	**Model 34a**	**Model 34b**	**Model 34c**
c	112.0232** (2.4714)	95.6002* (1.9911)	101.0429* (2.1412)
EG(-1)	1.3487 (1.5793)	0.5456 (0.4635)	0.7289 (0.6343)
EDU(-1)	0.0388 (1.2255)	0.0527 (1.5680)	0.0524 (1.4119)
ER	-12.7204** (-2.5486)	-10.4561* (-1.9266)	-11.2037* (-2.1173)
ICOR	-0.2339** (-2.1362)	-0.2216** (-2.0126)	-0.2243* (-2.0183)
INC	0.5693 (0.8582)	1.0635 (1.1687)	0.9929 (1.0935)
CPI(-1)	-0.0233 (-1.0819)	-0.0237 (-1.1015)	-0.0232 (-1.0710)
RR	0.0876 (0.4558)	-0.2902 (-0.7760)	
RR2			-0.2454 (-0.4038)
WTO	0.6245 (1.1955)	0.3492 (0.4934)	0.4517 (0.6700)
FTA	0.1959 (0.7692)	0.1537 (0.5700)	0.1673 (0.6249)
WTO*RR		0.2783 (0.6882)	
FTA*RR		0.0331 (0.4349)	
WTO*RR2			0.3752 (0.4932)
FTA*RR2			0.0517 (0.3416)
Adjusted R^2	0.848647	0.848261	0.847351
F-statistic	36.64507***	32.09591***	31.87729***
Periods	15 (2001-2015)	15 (2001-2015)	15 (2001-2015)
Cross-sections	6	6	6
Obs.	90	90	90

Note: Fixed effects models are appropriate; FDI is the dependent variable; GDP represents EG; FDI, GDP, ER, and INC are natural logarithm values; values in parentheses indicate t-statistics; ***, **, and * denote statistical significance at 1%, 5%, and 10% level, respectively; Obs. stands for the number of observations.
Source: Author's calculations

Table 5.36 The Effects of the New Laws on FDI at the Vietnam Provincial Level

Without a time lag	Coefficient (Dependent variable: FDI)		
Variable	**Model 35a**	**Model 35b**	**Model 35c**
c	-41.7645*** (-4.7960)	-44.0050*** (-5.0219)	-44.6187*** (-5.0496)
EG	0.5489*** (3.6246)	0.5854*** (3.8077)	0.5762*** (3.6660)
EDU	0.0037*** (3.3940)	0.0036*** (3.2532)	0.0036*** (3.2393)
ER	2.8255*** (2.8221)	3.0071*** (2.9933)	3.0398*** (3.0041)
ICOR	0.1140 (1.4109)	0.1207 (1.4959)	0.1304 (1.6162)
INC	0.0344 (0.1481)	-0.0808 (-0.3393)	-0.0592 (-0.2483)
CPI	0.1180*** (8.3627)	0.1184*** (8.4016)	0.1203*** (8.5319)
PR	-0.5250*** (-3.9839)	-0.0147 (-0.0539)	
PR2			-0.0390 (-0.1413)
LAW	-0.2331 (-1.1405)	0.7815 (1.5133)	0.5512* (1.7522)
LAW*PR		-0.5410** (-2.1292)	
LAW*PR2			-0.8835*** (-3.2107)
Adjusted R^2	0.400890	0.402838	0.403251
F-statistic	81.21339***	72.88103***	73.00450***
Periods	16 (2000-2015)	16 (2000-2015)	16 (2000-2015)
Cross-sections	60	60	60
Obs.	960	960	960

With a time lag	Coefficient (Dependent variable: FDI)		
Variable	**Model 35a**	**Model 35b**	**Model 35c**
c	-5.3719 (-0.5965)	-7.1676 (-0.7903)	-6.6128 (-0.7236)
EG(-1)	0.7759*** (4.8751)	0.8058*** (4.9939)	0.8194*** (4.9662)
EDU(-1)	0.0031** (2.5579)	0.0030** (2.4555)	0.0030** (2.4216)
ER	0.6660 (0.6211)	0.7997 (0.7431)	0.6931 (0.6398)
ICOR	-0.4837*** (-7.4313)	-0.4796*** (-7.3744)	-0.4778*** (-7.3434)
INC	0.1482 (0.5866)	0.0550 (0.2130)	0.0854 (0.3306)
CPI(-1)	-0.0350*** (-2.7579)	-0.0346*** (-2.7321)	-0.0341*** (-2.6916)
PR	-0.5705*** (-3.9401)	-0.0982 (-0.3156)	
PR2			-0.0910 (-0.2884)
LAW	0.1624 (0.7155)	1.0899* (1.8508)	0.8866** (2.5087)
LAW*PR		-0.4980* (-1.7013)	
LAW*PR2			-0.8296*** (-2.6323)
Adjusted R^2	0.314657	0.315596	0.313173
F-statistic	52.59409***	47.06122***	46.54641***
Periods	15 (2001-2015)	15 (2001-2015)	15 (2001-2015)
Cross-sections	60	60	60
Obs.	900	900	900

Note: The random effects models are appropriate; FDI is the dependent variable; RS represents EG; FDI, RS, ER, and INC are natural logarithm values; values in parentheses indicate t-statistics; ***, **, and * denote statistical significance at 1%, 5%, and 10% level, respectively; Obs. stands for the number of observations.
Source: Author's calculations

At the provincial level, the results of the Hausman test show that the random effect models are appropriate for Models 35a-c, 36a-c, and 37a-b. The effects of new laws on FDI attraction at the provincial level are shown in Tables 5.36 and 5.37. The coefficients of LAW are insignificant in Models 35a-b without and with a time lag. This implies that the 2005 new investment and enterprise laws have no impact on attracting FDI. However, the ranking of provinces based on the Decrees[35] guiding the investment laws has a significant link with FDI attraction at the provincial level in Vietnam. The coefficients of PR in Model 35a (see Table 5.36) are negative and significant at 1% level, which shows provinces ranked with a higher PR (under more difficult socio-economic conditions) attract less FDI.

The positive and significant effects of LAW on FDI are found at the provincial level in Models 35b-c (see Table 5.36). This agrees with the Nguyen, Zhang, et al.'s (2012) finding of a positive impact of the 2005 new laws on FDI. In addition, the results of the interaction terms of LAW with PR and PR2 show the different effects of LAW on FDI attraction in provinces and cities ranked differently (see Models 35b-c, Table 5.36). The effect of new laws in 2005 on FDI decreases in provinces under more difficult socio-economic conditions (see the summary of the effect of LAW on FDI with PR in Table 5.37).

Table 5.37 The Effects of the New Laws on FDI with PR at the Vietnam Provincial Level

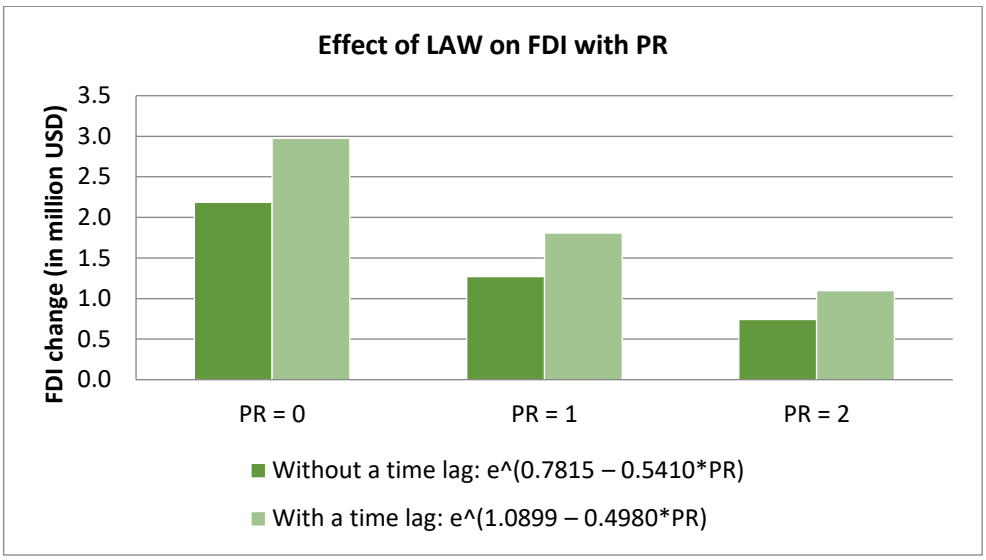
PR	**Without a time lag**	**With a time lag**
FDI change	$e^{0.7815 - 0.5410*PR}$	$e^{1.0899 - 0.4980*PR}$
PR = 0	2.1847	2.9740
PR = 1	1.2719	1.8074
PR = 2	0.7404	1.0984

Note: The effect of LAW on FDI (FDI change in million USD, on average) is computed as the inverse of the natural logarithm of the number (Ln) because FDI in the regression models is a natural logarithm value. The values of 0.7815 and 1.0899 are the coefficients of LAW in Model 35b without and with a lag term, respectively (see Table 5.36). The values of -0.5410 and -0.4980 are the coefficients of interaction terms of LAW with PR in Model 35b (without and with a lag term, respectively).
Source: Author's calculations

If LAW = 1, the change in FDI on average during 2005-2015 compared with FDI before 2005 is reported in Table 5.37 (without and with a time lag, respectively) as follows:

- the FDI in provinces with PR = 0 (not difficult) increases 2.1847 and 2.9740 million USD;
- the FDI in provinces with PR = 1 (difficult) increases 1.2719 and 1.8074 million USD; and
- the FDI in provinces with PR = 2 (extremely difficult) increases 0.7404 and 1.0984 million USD.

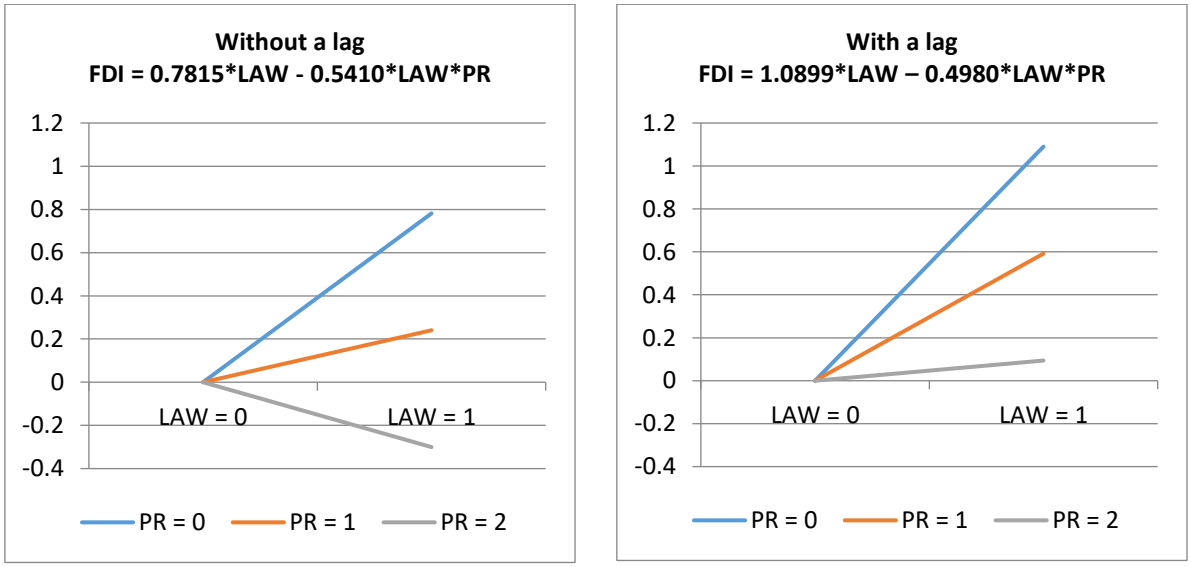
[35] PR is based on Decree No. 24/2000/ND-CP (Government, 2000) and Decree No. 108/2006/ND-CP (Government, 2006).



Source: Author's calculations

Figure 5.6 The Decreasing Effect of LAW on FDI with PR at the Vietnam Provincial Level

The negative, significant coefficients of the interaction of LAW with PR (see Table 5.37, Figures 5.6 and 5.7) show the decreasing effect of LAW on FDI in provinces and cities under the socio-economic conditions from "less difficult" to "more difficult".



Note: FDI is in natural logarithm values.
Source: Author's calculations

Figure 5.7 The Regression Lines for the Effect of LAW on FDI with PR at the Vietnam Provincial Level

The regression line slopes of the effect of LAW on FDI are different for different PRs (see Figure 5.7). The coefficients of the interaction term indicate differences in the slopes. Figure 5.7 shows that changes in laws may marginally impact on FDI attraction in provinces and cities under more difficult socio-economic conditions. The effect of LAW on FDI at the provincial level is re-checked using Model 35c with the interaction term of LAW with PR2. The negative, significant (at 1%) coefficients of the

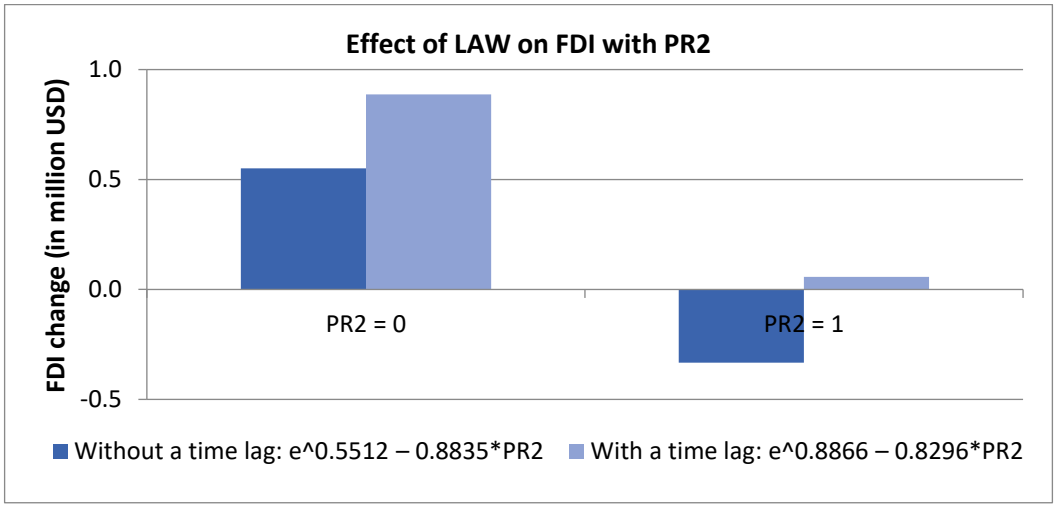
interaction term (see Table 5.36) confirms the decreasing effect of LAW on FDI in provinces under more difficult socio-economic conditions (see the summary of the effect of LAW on FDI with PR in Table 5.37 and PR2 in Table 5.38).

Table 5.38 The Effects of the New Laws on FDI with PR2 at the Vietnam Provincial Level

PR2	Without a time lag	With a time lag
FDI change	$e^{0.5512 - 0.8835*PR2}$	$e^{0.8866 - 0.8296*PR2}$
PR2 = 0	0.5512	0.8866
PR2 = 1	-0.3323	0.0570

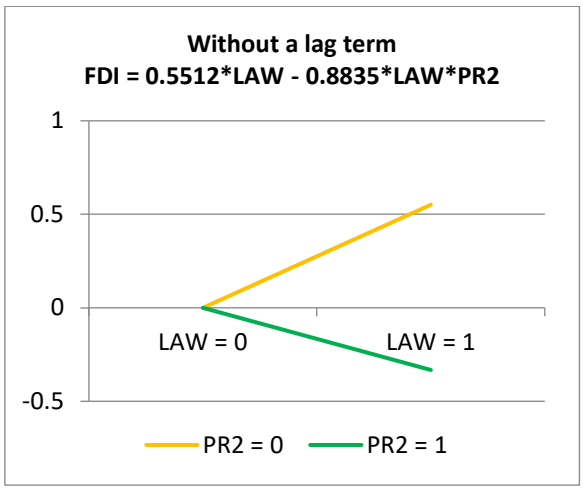
Note: The effect of LAW on FDI (FDI change in million USD on average) is computed as the inverse of the natural logarithm of number (Ln) because FDI in the regression models is a natural logarithm value. The values of 0.5512 and 0.8866 are the coefficients of LAW in Model 35c without and with a lag term, respectively (see Table 5.36). The values of -0.8835 and -0.8296 are the coefficients of interaction terms of LAW with PR2 in Model 35c (without and with a lag term, respectively).
Source: Author's calculations

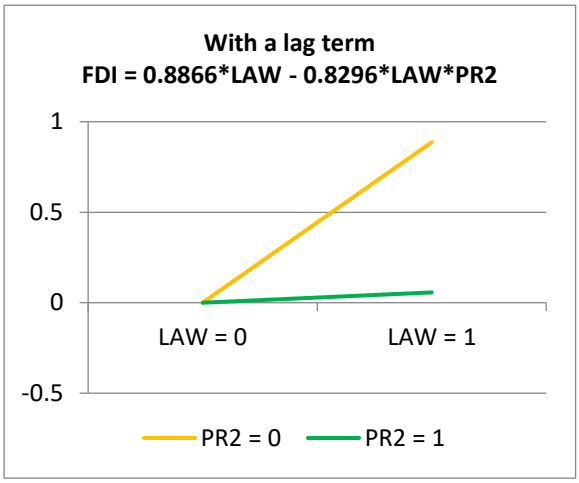
Figure 5.8 shows the new laws in 2005 may have led to a drop in FDI flows into provinces under extremely difficult socio-economic conditions (PR2=1). Figure 5.9 presents the different regression lines on the effect of LAW on FDI with PR2 from 2000 to 2015. This implies that the effects of LAW in attracting FDI are not the same in areas ranked differently and changes in laws may not benefit foreign investors in areas under extremely difficult socio-economic conditions.



Source: Author's calculations

Figure 5.8 The Decreasing Effect of LAW on FDI with PR2 at the Vietnam Provincial Level





Note: FDI is in natural logarithm values.
Source: Author's calculations

Figure 5.9 Regression Lines for the Effect of LAW on FDI with PR2 at the Vietnam Provincial Level

The effects of WTO and FTA on FDI attraction at the provincial level are reported in Table 5.39. The coefficients of FTA in Models 36a-c are negative and significant at the 1% level without and with a time lag. The increase in the number of FTAs Vietnam joined does not bring in more FDI into provinces and cities. The coefficients of WTO are positive and significant at 1% level only with a lag term (see Table 5.39). Neither WTO nor FTA has any significant coefficient for the interaction term with PR or PR2 (see Models 36b-c in Table 5.39). This implies that there is no difference in the effects of WTO and FTA on provinces and cities ranked differently.

The effects of laws including LAW, WTO and FTA at the provincial level are reported in Table 5.40. The regressed results from Models 37a-b (see Table 5.40) provide results consistent with the findings of the effects of LAW in Table 5.36 and the effects of WTO and FTA in Table 5.39. The new laws in 2005 have a positive, significant effect on FDI attraction at the provincial level and the effects of LAW are different in provinces and cities under different socio-economic conditions (see the negative, significant coefficients of the interaction terms of LAW with PR and PR2 in Tables 5.36 and 5.40). FTA negatively and significantly affects FDI attraction at the provincial level in Vietnam (see Tables 5.39 and 5.40). WTO positively affects FDI attraction; the effect of WTO is significant at the 1% level with a lag term in EG, EDU, and CPI (see Tables 5.39 and 5.40). However, the effects of WTO and FTA are not different for provinces and cities ranked differently (see the insignificant coefficients of their interaction terms with PR and PR2 in Tables 5.39 and 5.40).

Table 5.39 The Effects of WTO and FTA on FDI at the Vietnam Provincial Level

Without a Time Lag	Coefficient – FDI is a dependent variable		
Variable	**Model 36a**	**Model 36b**	**Model 36c**
c	-148.9571*** (-6.3939)	-149.0758*** (-6.3932)	-148.2869*** (-6.3565)
EG	0.5841*** (3.8824)	0.5791*** (3.7741)	0.6080*** (3.8744)
EDU	0.0036*** (3.3464)	0.0037*** (3.3432)	0.0035*** (3.2047)
ER	13.8613*** (5.6240)	13.8674*** (5.6200)	13.7084*** (5.5562)
ICOR	0.2009** (2.3113)	0.2013** (2.3149)	0.2020** (2.3223)
INC	0.1887 (0.8849)	0.2015 (0.9108)	0.1646 (0.7361)
CPI	0.1237*** (6.9889)	0.1237*** (6.9830)	0.1247*** (7.0364)
PR	-0.5170*** (-3.9411)	-0.5148** (-2.2255)	
PR2			-0.3334 (-1.1236)
WTO	0.4953 (1.5638)	0.8537 (1.5148)	0.8917* (1.9194)
FTA	-0.6545*** (-4.5979)	-0.6993*** (-4.3240)	-0.6391*** (-4.1410)
WTO*PR		-0.2186 (-0.7683)	
FTA*PR		0.0271 (0.6265)	
WTO*PR2			-0.4730 (-1.0525)
FTA*PR2			-0.0075 (-0.1041)
Adjusted R^2	0.414572	0.413600	0.412763
F-statistic	76.45743***	62.49124***	62.27910***
Periods	16 (2000-2015)	16 (2000-2015)	16 (2000-2015)
Cross-sections	60	60	60
Obs.	960	960	960

With a Time Lag	Coefficient – FDI is a dependent variable		
Variable	**Model 36a**	**Model 36b**	**Model 36c**
c	-129.7905*** (-5.3412)	-130.1479*** (-5.3493)	-128.9084*** (-5.2950)
EG(-1)	0.7058*** (4.5042)	0.6933*** (4.3501)	0.7318*** (4.4866)
EDU(-1)	0.0029** (2.3916)	0.0029** (2.4215)	0.0028** (2.2648)
ER	13.9975*** (5.4596)	14.0370*** (5.4666)	13.8129*** (5.3790)
ICOR	-0.4500*** (-7.4266)	-0.4499*** (-7.4180)	-0.4502*** (-7.4204)
INC	0.0967 (0.4158)	0.1332 (0.5503)	0.0850 (0.3486)
CPI(-1)	-0.0500*** (-4.1208)	-0.0504*** (-4.1357)	-0.0489*** (-4.0155)
PR	-0.5392*** (-3.8266)	-0.6167** (2.4215)	
PR2			-0.3943 (-1.2037)
WTO	2.0786*** (7.4445)	2.3367*** (4.1864)	2.4670*** (5.4961)
FTA	-0.8446*** (-5.8198)	-0.9013*** (-5.4185)	-0.8375*** (-5.2818)
WTO*PR		-0.1627 (-0.5507)	
FTA*PR		0.0322 (0.7100)	
WTO*PR2			-0.4588 (-0.9841)
FTA*PR2			-0.0004 (-0.0005)
Adjusted R^2	0.351510	0.350174	0.347719
F-statistic	55.14422***	45.04058***	44.56721***
Periods	15 (2001-2015)	15 (2001-2015)	15 (2001-2015)
Cross-sections	60	60	60
Obs.	900	900	900

Notes: The random effects models are appropriate; FDI is the dependent variable; RS represents EG; FDI, RS, ER, and INC are natural logarithm values; Values in parentheses indicate t-statistics; ***, **, and * denote statistical significance at 1%, 5%, and 10% level, respectively; Obs. stands for the number of observations.
Source: Author's calculations

Table 5.40 The Effects of Laws on FDI at the Vietnam Provincial Level

Without a Time Lag	Coefficient (Dependent variable: FDI)	
Variable	Model 37a	Model 37b
c	-160.3972*** (-6.3005)	-163.1349*** (-6.4060)
EG	0.5788*** (3.7467)	0.5774*** (3.6533)
EDU	0.0036*** (3.2697)	0.0035*** (3.1759)
ER	15.0995*** (5.5382)	15.3854*** (5.6387)
ICOR	0.2257** (2.4989)	0.2369*** (2.6274)
INC	0.0333 (0.1342)	-0.0029 (-0.0117)
CPI	0.1219*** (6.9457)	0.1230*** (7.0095)
PR	-0.0957 (-0.3361)	
PR2		-0.0707 (-0.2287)
LAW	1.4968** (2.4989)	1.0172*** (2.7059)
WTO	0.4799 (0.8119)	0.6430 (1.3410)
FTA	-0.7648*** (-4.5879)	-0.7340*** (-4.5541)
LAW*PR	-0.7129** (-2.2619)	
WTO*PR	0.0325 (0.1074)	
FTA*PR	0.0338 (0.7731)	
LAW*PR2		-0.9002** (-2.3294)
WTO*PR2		-0.0700 (-0.1474)
FTA*PR2		0.0177 (0.2408)
Adjusted R^2	0.415906	0.415799
F-statistic	53.52765***	53.50452***
Periods	16 (2000-2015)	16 (2000-2015)
Cross-sections	60	60
Obs.	960	960

With a Time Lag	Coefficient (Dependent variable: FDI)	
Variable	Model 37a	Model 37b
c	-160.4883*** (-6.0714)	-163.0528*** (-6.1635)
EG(-1)	0.6540*** (4.0836)	0.6548*** (3.9937)
EDU(-1)	0.0028** (2.3307)	0.0027** (2.2395)
ER	17.4566*** (6.1546)	17.7342*** (6.2455)
ICOR	-0.3864*** (-6.0071)	-0.3785*** (-5.8906)
INC	-0.2098 (-0.7971)	-0.2477 (-0.9451)
CPI(-1)	-0.0597*** (-4.7888)	-0.0595*** (-4.7741)
PR	-0.0838 (-0.2655)	
PR2		-0.0321 (-0.0932)
LAW	1.9279*** (2.9813)	1.4048*** (3.5040)
WTO	2.0829*** (3.5584)	2.3180*** (4.9881)
FTA	-1.0475*** (-6.1173)	-1.0214*** (-6.1732)
LAW*PR	-0.7218** (-2.1265)	
WTO*PR	0.0764 (0.2449)	
FTA*PR	0.0253 (0.5584)	
LAW*PR2		-0.8664** (-2.1218)
WTO*PR2		-0.0541 (-0.1102)
FTA*PR2		0.0041 (0.0537)
Adjusted R^2	0.356265	0.355219
F-statistic	39.27207***	39.09791***
Periods	15 (2001-2015)	15 (2001-2015)
Cross-sections	60	60
Obs.	900	900

Note: The random effects models are appropriate; FDI is the dependent variable; RS represents EG; FDI, RS, ER, and INC are natural logarithm values; values in parentheses indicate t-statistics; ***, **, and * denote statistical significance at 1%, 5%, and 10% level, respectively; Obs. stands for the number of observations.
Source: Author's calculations

Table 5.41 A Summary of the Effects of Laws on FDI in Vietnam

No.	Hypothesis	Finding		
		National	Regional	Provincial
$H_{3.1}$	There is a significant growth of FDI in Vietnam, especially in the first ranked provinces following the release of the new law of investment and enterprise in 2005.	No	No	Yes
$H_{3.2}$	There is a significant growth of FDI in Vietnam, especially in the first ranked provinces following Vietnam's WTO and FTA membership.	No	No	Mixed
Q3. ***Does the rule of laws matter in attracting FDI to Vietnam?*** 1. At the national level, the effects of laws on FDI attraction are insignificant. 2. At the regional level, the effects of laws on FDI attraction are insignificant and not different among different regions. 3. At the provincial level: i. The release of new laws in 2005 significantly, positively impacts FDI, especially in the first ranked provinces without difficulties in socio-economics conditions. ii. The positive effect of new laws in 2005 on FDI decreases in provinces under more difficult socio-economic conditions. iii. Provinces ranked with higher PR (under more difficult socio-economic conditions) attract less FDI. iv. Vietnam's FTA membership significantly, negatively affected FDI attraction. v. Vietnam's WTO membership significantly, positively affected FDI attraction. vi. The effects of WTO and FTA membership are not different in provinces and cities ranked differently.			

In conclusion, $H_{3.1}$ and $H_{3.2}$ cannot be accepted at the national and regional levels for Vietnam (see Table 5.41). At the provincial level, the rule of law significantly affected FDI attraction in Vietnam over 2000-2015. The effects of the new laws in 2005 on FDI are different in different provinces and cities. The impact of Vietnam's WTO and FTA membership is not different in provinces and cities under different socio-economic conditions. Table 5.41 summarises the effects of laws on FDI at the national, regional and provincial levels.

5.3.4 FDI Location Selection

This section reports the results on the determinants affecting FDI location selection from the investors' viewpoint at national, regional, and provincial levels in Vietnam (see Tables 5.42 - 5.47). The results in Table 5.42 show how significantly the education factor (EDU), the economic factors (EG, ER, ICOR, INC, CPI, STATE and CRI), the institutional factor (CR), and infrastructure development (COM, FRE and BED) affected foreign investors' decisions on investing in Vietnam at the national level. Models 38 and 39 are regressed without and with a time lag in EG, EDU, CPI and STATE.

In general, the education factor significantly, positively affected FDI in both Models 38 and 39. The coefficients of ER are negative and significant only in Model 38. This implies that the higher VND/USD exchange rate negatively impacts the investment decisions of foreign investors. The results of the effects of ICOR, INC and CR on FDI are mixed (see Models 38 and 39, Table 5.44). The positive, significant coefficient of CR with a time lag shows that political risk is more likely to affect investment decisions. The higher value of CR (representing the lower risk level of CR) brings more FDI to Vietnam. The coefficients of CPI and STATE are insignificant (see Table 5.44). Interestingly, the positive, significant coefficients of CRI in Table 5.44 show there was an increase in FDI flows into Vietnam after the financial crisis in 2008. In terms of infrastructure development, COM, FRE, and BED have insignificant effects on FDI attraction to Vietnam (see Model 39, Table 5.44); the coefficient of FRE is negative and significant at the 5% level with a lag term. This implies that infrastructure development is not a determinant affecting foreign investors' decisions on investing in Vietnam.

The results of FDI location selection at the regional level are shown in Table 5.43. In general, the results of the regressors EG, EDU, ER, ICOR, INC, CPI, CRI, CR, FRE and BED are mixed in Models 40-42 (see Table 5.43). The coefficients of CR with a time lag are positive and significant. This implies that political risk is more likely to impact on investment decisions. The insignificant coefficients of the interaction terms of CRI, CR, FRE, and BED with RR2 (see Table 5.43) show the effects of the variables are not different in the different Vietnam regions.

The results of the Hausman test show that random effects models are appropriate at the provincial level. The empirical results of the determinants of FDI location selection are reported in Tables 5.44 - 5.45 (2000-2015) and Tables 5.46 - 5.47 (2005-2015). The results in Tables 5.44 - 5.47 show that provincial competition and institutional factors including IIP, PCI, and CR, are determinants that affect FDI location selection by foreign investors at the Vietnam provincial level. The negative coefficients of IIP (see Models 43-52) show foreign investors are less interested in provinces offering more investment incentives (higher IIP). The positive, significant coefficients of PCI in Models 48-52 (see Tables 5.46 - 5.47) confirm that foreign investors are more likely to invest in provinces and cities with better governance (higher PCI) in Vietnam. CR positively affects the FDI location selection, the coefficients of CR are especially positive and significant at the 1% level with a time lag (see Tables 5.45 - 5.47). This implies that political stability is more likely to attract the interest of investors. However, the effects of CR on the FDI location decision are not different in different provinces and cities (see the insignificant coefficients of the interaction terms of CR with PR2 in Models 45, 46, 50, and 51 in Tables 5.44, 5.45, 5.46, and 5.47).

Table 5.42 FDI Location Selection at the Vietnam National Level

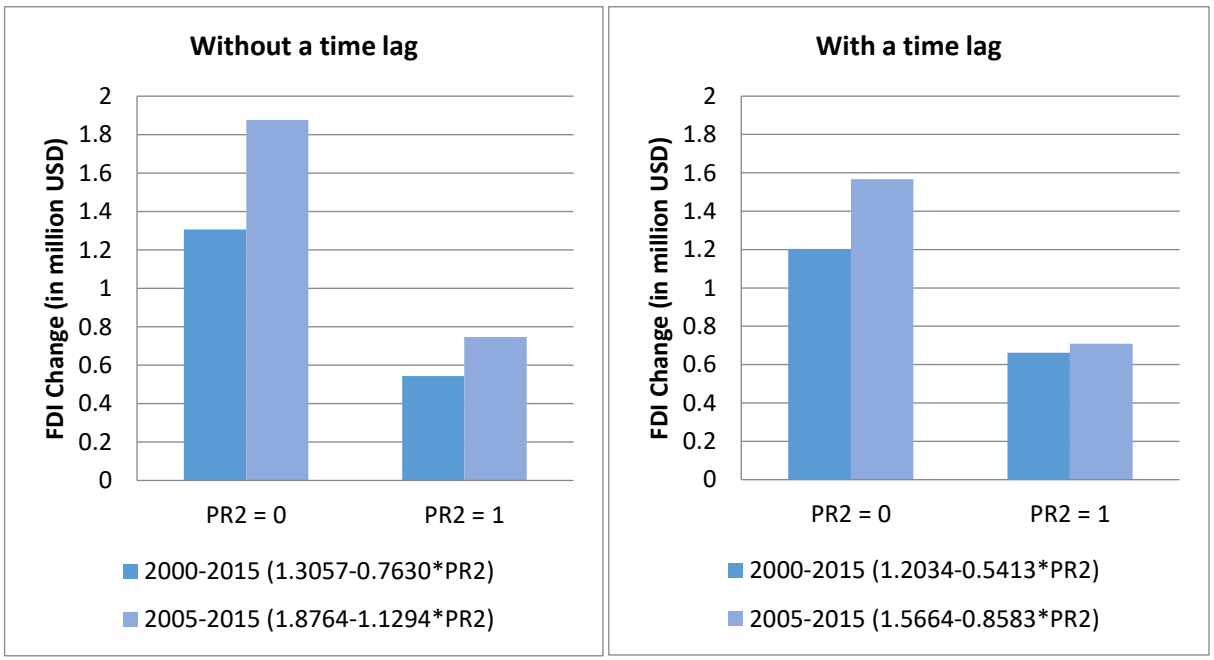
Without a time lag	Coefficient (Dependent variable: FDI)	
Variable	**Model 38**	**Model 39**
c	141.6098*** (7.0896)	130.3617** (3.1391)
EG	7.8240*** (5.5092)	5.6803 (1.9425)
EDU	0.0772** (2.4967)	0.0848 (1.4657)
ER	-19.8111*** (-7.0453)	-17.4726 (-2.1578)
ICOR	0.4151*** (4.6567)	0.2778 (1.5168)
INC	-5.8220*** (-4.1634)	-2.1434 (-0.4357)
CPI	0.0279* (1.9078)	0.0330 (1.2191)
STATE	-0.0331 (-1.8936)	-0.0266 (-0.5520)
CRI	0.5752*** (3.5822)	0.7178 (2.3211)
CR	-13.0642*** (-3.6181)	-7.5516 (-0.6838)
COM		-0.2126 (-0.7432)
FRE		-1.4324 (-0.4852)
BED		0.5687 (0.1035)
Adjusted R^2	0.988069	0.982415
F-statistic	148.2210***	70.83229***
Obs.	17 (1999-2015)	16 (2000-2015)

With a time lag	Coefficient (Dependent variable: FDI)	
Variable	**Model 38**	**Model 39**
c	84.9647*** (3.9883)	125.4328*** (6.2043)
EG(-1)	1.9923 (1.4560)	-0.2005 (-0.1587)
EDU(-1)	0.0911** (2.5409)	0.0851** (4.2758)
ER	-10.9645*** (-4.8468)	-0.0721 (-0.0250)
ICOR	-0.0982 (-1.4799)	-0.1920** (-4.1236)
INC	-0.1350 (-0.0848)	8.0918** (3.6115)
CPI(-1)	-0.0219 (-0.9162)	-0.0283 (-1.8931)
STATE(-1)	0.0099 (0.1988)	0.0127 (0.4637)
CRI	1.0794** (3.3930)	1.1705** (4.8964)
CR	6.9104 (1.2216)	19.8744** (3.5655)
COM		0.0594 (0.3725)
FRE		-5.8402** (-4.4127)
BED		-9.1555* (-2.9664)
Adjusted R^2	0.977679	0.994129
F-statistic	74.00179***	212.6576***
Obs.	16 (2000-2015)	16 (2000-2015)

Note: FDI is the dependent variable; GDP represents EG; FDI, GDP, ER, and INC are natural logarithm values; Values in parentheses indicate t-statistics; ***, **, and * denote statistical significance at 1%, 5%, and 10% level, respectively; Obs. stands for the number of observations.
Source: Author's calculations

In terms of the effects of infrastructure development (FRE, BED, and WEB) on the FDI location selection, infrastructure development in health care (such as BED) and official electronic information (such as WEB) are not significant (see the insignificant coefficients of BED and WEB in Tables 5.44 - 5.47). The insignificant coefficients of the interaction terms of BED and WEB with PR2 (see Models 45 and 47 in Tables 5.44 and 5.45, and Models 50 and 52 in Tables 5.46 and 5.47) show the effects of the variables on the FDI location selection are not different in different Vietnam provinces and cities.

However, the coefficients of FRE are positive and significant at the 1% level (see Models 43-52 in Tables 5.44 - 5.47). This implies infrastructure development supporting goods freight is likely very important in attracting the interest of foreign investors at the Vietnam provincial level. The coefficients of the interaction terms of FRE with PR2 are significant at the 5% and 10% level in Tables 5.44 and 5.45, respectively from 2000 to 2015. The regression results of the sample 2005-2015 show the coefficients of the interaction terms are significant at the 5% level in Model 50 (see Table 5.46), and at the 10% level in Model 52 (see Table 5.47). Therefore, the effect of FRE is likely different in different areas, which shows that there is a geographical concentration of FDI at the Vietnam provincial level. The negative, significant coefficients of the interaction term (see Tables 5.44 - 5.47) show the decreasing effect of FRE on the FDI location selection in provinces under more difficult socio-economic conditions (see the summary of the effect of FRE on the FDI location selection with PR2 in Appendix Table C.1). Figure 5.10 shows the different effects of FRE on FDI location selection in different Vietnam provinces and cities.



Source: Author's calculations

Figure 5.10 The Different Effects of FRE on FDI Location Selection with PR2 at the Vietnam Provincial Level

Table 5.48 summarises the coefficients of the regressors in Models 43-52 without and with a lag. Consistently, RS representing EG and the human capital factor (EDU) positively and significantly affects FDI attraction at the provincial level (see Table 5.48). For the economic factors, the positive, significant coefficients of ER show foreign investors tend to invest more into Vietnam as the USD is stronger. The positive coefficients of ICOR without a time lag correctly explain the positive relationship between ICOR and the total capital including FDI in the formula $ICOR_t = I_t/(GDP_t - GDP_{t-1})$. However, the negative, significant coefficients of ICOR with a time lag show that the efficiency of the total capital invested negatively affects the investment decisions of foreign investors (see Table 5.48). This implies that investors tend to invest more into Vietnam as capital is more efficient (or ICOR is smaller). The insignificant coefficients of INC (see Table 5.48) imply that monthly average income is not a determinant of FDI attraction. Inflation rate has a positive, significant effect on FDI attraction without a time lag (see the coefficients of CPI in Tables 5.44 and 5.46), but it has negative, significant effect on FDI attraction with a time lag (see the coefficients of CPI(-1) in Tables 5.45 and 5.47). This implies a lower inflation rate in the previous year is likely to encourage foreign investors to invest more into Vietnam the following year. The financial crisis in 2008 negatively impacted FDI flows into Vietnam without a time lag (see the negative, significant coefficients of CRI in Tables 5.44 and 5.46), but the impact is not significant with a lag term (see Tables 5.45, 5.47 and 5.48). The insignificant coefficients of the interaction terms of CRI with PR2 (see Tables 5.44 - 5.48) show the effects of CRI are not different in provinces and cities ranked differently.

Table 5.43 The Empirical Results of FDI Location Selection at the Vietnam Regional Level

Without a time lag	Coefficient – FDI is a dependent variable		
Variable	**Model 40**	**Model 41**	**Model 42**
c	19.9836 (0.4733)	70.7126 (1.3415)	84.5585 (1.5609)
EG	1.2405 (1.5458)	3.6436** (2.1076)	2.2772 (1.1733)
EDU	0.0040 (0.1204)	0.0056 (0.1694)	0.0485 (0.9418)
ER	-5.0024 (-1.1213)	-5.4909 (-1.0695)	-6.3227 (-1.2409)
ICOR	0.1161 (0.6750)	0.1940 (1.1124)	0.2178 (1.2124)
INC	1.0780* (1.7265)	0.8901 (1.3522)	2.0857** (2.3751)
CPI	0.0810*** (2.6729)	0.0819*** (2.7043)	0.0920*** (2.9929)
CRI	-0.4916 (-1.1796)	-0.7689 (-1.5777)	-0.4412 (-0.6252)
CR	5.6305 (0.6704)	6.1847 (0.7088)	5.8362 (0.5380)
RR		0.0154 (0.0662)	
RR2			-16.7946 (-0.7578)
FRE		-1.6079 (-1.2005)	-2.1033 (-1.3718)
BED		-5.3567** (-1.9963)	-4.8441*(-1.7213)
CRI*RR2			-0.1802 (-0.2521)
CR*RR2			-11.4503 (-1.1100)
FRE*RR2			0.2833 (0.2377)
BED*RR2			2.0437 (0.8328)
Adjusted R^2	0.85748	0.861791	0.863233
F-statistic	44.96713***	38.02267***	30.98055***
Periods	16 (2000-2015)	16 (2000-2015)	16 (2000-2015)
Cross-sections	6	6	6
Obs.	96	96	96

With a time lag	Coefficient – FDI is a dependent variable		
Variable	**Model 40**	**Model 41**	**Model 42**
c	30.9340 (0.7399)	100.4115* (1.8979)	94.0571* (1.7861)
EG(-1)	1.4318* (1.7521)	4.6965*** (2.7161)	2.5865 (1.3102)
EDU(-1)	0.0421 (1.3625)	0.0515* (1.6694)	0.0845* (1.8235)
ER	-5.3007 (-1.1740)	-9.6460* (-1.8659)	-8.1998 (-1.5144)
ICOR	-0.2828** (-2.5468)	-0.4000*** (-3.2330)	-0.3519** (-2.6206)
INC	0.3476 (0.5463)	-0.0706 (-0.1029)	1.1355 (1.1997)
CPI(-1)	-0.0234 (-1.0286)	-0.0275 (-1.1852)	-0.0264 (-1.1470)
CRI	0.2641 (0.6435)	0.0433 (0.1004)	0.1363 (0.2349)
CR	16.0366** (2.2756)	18.7320** (2.6089)	14.9033 (1.5763)
RR		0.0962 (0.4028)	
RR2			-33.8697 (-1.5107)
FRE		-2.6943** (-2.0255)	-2.4223 (-1.5682)
BED		-3.1454 (-1.1036)	-2.4998 (-0.8289)
CRI*RR2			-0.0078 (-0.0110)
CR*RR2			-4.3891 (-0.4225)
FRE*RR2			-0.2635 (-0.1866)
BED*RR2			3.8087 (1.3845)
Adjusted R^2	0.851833	0.855621	0.858902
F-statistic	40.35953***	33.96452***	28.08841***
Periods	15 (2001-2015)	15 (2001-2015)	15 (2001-2015)
Cross-sections	6	6	6
Obs.	90	90	90

Notes: The fixed effects models are appropriate; FDI is the dependent variable; RS represents EG; FDI, RS, ER, and INC are natural logarithm values; Values in parentheses indicate t-statistics; ***, **, and * denote statistical significance at 1%, 5%, and 10% level, respectively; Obs. stands for the number of observations.
Source: Author's calculations

Table 5.44 FDI Location Selection without a Time Lag at the Vietnam Provincial Level 2000-2015

	Coefficient (Dependent variable: FDI)				
Variable	**Model 43**	**Model 44**	**Model 45**	**Model 46**	**Model 47**
c	-60.2664*** (-3.8376)	-57.8730*** (-3.6163)	-67.9927*** (-4.0469)	-59.0780*** (-3.6447)	-64.5098*** (-3.9458)
EG	0.3767** (2.0385)	0.3884** (2.1286)	0.3478* (1.8643)	0.3916** (2.1404)	0.3592** (1.9242)
EDU	0.0357*** (3.2710)	0.0363*** (3.3360)	0.0036*** (3.3002)	0.0366*** (3.3516)	0.0342*** (3.1200)
ER	4.4604*** (2.9012)	4.2390*** (2.7237)	4.6303*** (2.9063)	4.2027*** (2.6990)	4.6705*** (2.9735)
ICOR	0.2050** (2.3181)	0.2043** (2.3083)	0.2119** (2.4007)	0.2038** (2.2944)	0.1965** (2.2208)
INC	-0.0285 (-0.1262)	-0.0275 (-0.1217)	-0.1372 (-0.5733)	-0.0250 (-0.1056)	-0.0838 (-0.3675)
CPI	0.1326*** (8.1783)	0.1329*** (8.1664)	0.1342*** (8.2231)	0.1329*** (8.1557)	0.1345*** (8.2651)
CRI	-0.7577*** (-3.5551)	-0.7475*** (-3.4596)	-1.0137*** (-2.9124)	-0.6435* (-1.9127)	-0.7432*** (-3.4224)
IIP	-0.8167*** (-2.5840)	-0.6251 (-0.9522)	-0.069 (-0.1135)	-0.5905 (-0.7588)	-0.4818 (-0.6788)
CR	-0.1319 (-0.0337)	-0.6281 (-0.1561)	1.9678 (0.3334)	1.5647 (0.2693)	0.0924 (0.0229)
PR2		-0.1537 (-0.3631)	8.6449* (1.7525)	1.8776 (0.4883)	0.0849 (0.1777)
FRE	0.6363*** (4.2959)	0.6362*** (4.3321)	1.3057*** (4.1882)	0.6311*** (4.2918)	0.4472*** (2.6262)
BED	-0.3630 (-1.2267)	-0.3692 (-1.2672)	-0.4553 (-0.9395)	-0.3667 (-1.2599)	0.1607 (0.4015)
WEB	0.0384 (0.7345)	0.0391 (0.7522)	0.0181 (0.2030)	0.0409 (0.7814)	0.0300 (0.3527)
CRI*PR2			0.3945 (1.1298)	-0.1352 (-0.4328)	
CR*PR2			-3.2828 (-0.5881)	-2.9572 (-0.5372)	
FRE*PR2			-0.7630** (-2.3892)		0.0000** (2.4848)
BED*PR2			-0.0103 (-0.0196)		-0.0002* (-1.9598)
WEB*PR2			0.0344 (0.3509)		-0.0105 (-0.1111)
Adjusted R^2	0.415386	0.415562	0.418706	0.414628	0.417066
F-statistic	57.78321***	53.45327***	39.37602***	46.28491***	43.88293***
Periods	16 (2000-2015)	16 (2000-2015)	16 (2000-2015)	16 (2000-2015)	16 (2000-2015)
Cross-sections	60	60	60	60	60
Obs.	960	960	960	960	960

Note: The random effects models are appropriate; FDI is the dependent variable; RS represents EG; FDI, GDP, ER, and INC are natural logarithm values; values in parentheses indicate t-statistics; ***, **, and * denote statistical significance at 1%, 5%, and 10% level, respectively; Obs. stands for the number of observations.
Source: Author's calculations

Table 5.45 FDI Location Selection with a Time Lag at the Vietnam Provincial Level 2000-2015

	Coefficient (Dependent variable: FDI)				
Variable	**Model 43**	**Model 44**	**Model 45**	**Model 46**	**Model 47**
c	-49.7994*** (-2.9691)	-51.5082*** (-3.0342)	-58.9679*** (-3.3529)	-53.0733*** (-3.0867)	-56.5058*** (-3.2503)
EG(-1)	0.4902** (2.5251)	0.5212*** (2.7174)	0.4863** (2.4624)	0.5084*** (2.6430)	0.5169*** (2.6344)
EDU(-1)	0.0302** (2.5153)	0.0294** (2.4571)	0.0281** (2.3238)	0.0296** (2.4676)	0.0286** (2.3695)
ER	4.5753*** (2.8033)	4.6962*** (2.8575)	5.0505*** (3.0329)	4.6218*** (2.8078)	4.9575*** (2.9921)
ICOR	-0.5221*** (-8.2302)	-0.5161*** (-8.0965)	-0.5176*** (-8.0726)	-0.5121*** (-8.0028)	-0.5218*** (-8.1909)
INC	-0.1844 (-0.7428)	-0.1801 (-0.7259)	-0.1718 (-0.6486)	-0.0955 (-0.3645)	-0.3263 (-1.2630)
CPI(-1)	-0.0497*** (-3.7517)	-0.0518*** (-3.8581)	-0.0518*** (-3.7927)	-0.0539*** (-3.9597)	-0.0483*** (-3.5786)
CRI	0.1474 (0.6242)	0.1199 (0.5041)	-0.0126 (-0.0347)	-0.0198 (-0.0550)	0.1522 (0.6381)
IIP	-1.0365*** (-3.0160)	-1.5995** (-2.2700)	-1.8662** (-2.1529)	-2.0383** (-2.4095)	-0.9186 (-1.1390)
CR	15.3720*** (4.0234)	16.1077*** (4.0927)	19.4434*** (3.2205)	19.3272*** (3.2467)	15.8938*** (4.0398)
PR2		0.4052 (0.8856)	2.9988 (0.7067)	3.3007 (0.8084)	3.9583 (1.2805)
FRE	0.7422*** (4.6602)	0.7599*** (4.8096)	0.5988*** (3.2012)	0.7617*** (4.8057)	1.2034*** (3.8022)
BED	-0.5079 (-1.5937)	-0.5280* (-1.6820)	-0.0677 (-0.1566)	-0.5330* (-1.6972)	-0.6378 (-1.2206)
WEB	0.0055 (0.0991)	0.0040 (0.0734)	-0.0057 (-0.0605)	0.0110 (0.1986)	-0.0486 (-0.5261)
CRI*PR2			0.1562 (0.4582)	0.1560 (0.4648)	
CR*PR2			-3.3558 (-0.5583)	-4.0623 (-0.6950)	
FRE*PR2			0.0000* (1.8960)		-0.5413* (-1.6650)
BED*PR2			-0.0002 (-1.5775)		0.1191 (0.2083)
WEB*PR2			0.0043 (0.0408)		0.0712 (0.6905)
Adjusted R^2	0.339182	0.340543	0.33943	0.339933	0.34011
F-statistic	39.45296***	36.71099***	26.66364***	31.86552***	29.95932***
Periods	15 (2001-2015)	15 (2001-2015)	15 (2001-2015)	15 (2001-2015)	15 (2001-2015)
Cross-sections	60	60	60	60	60
Obs.	900	900	900	900	900

Note: The random effects models are appropriate; FDI is the dependent variable; RS represents EG; FDI, GDP, ER, and INC are natural logarithm values; values in parentheses indicate t-statistics; ***, **, and * denote statistical significance at 1%, 5%, and 10% level, respectively; Obs. stands for the number of observations.
Source: Author's calculations

Table 5.46 FDI Location Selection without a Time Lag at the Vietnam Provincial Level 2005-2015

	Coefficient (Dependent variable: FDI)				
Variable	**Model 48**	**Model 49**	**Model 50**	**Model 51**	**Model 52**
c	-95.2882*** (-4.4163)	-90.8442*** (-4.2026)	-99.4935*** (-4.4297)	-89.9999*** (-4.1081)	-92.8997*** (-4.2165)
EG	0.5108** (2.0343)	0.5100** (2.0636)	0.3859 (1.4941)	0.5071** (2.0387)	0.5180** (2.0246)
EDU	0.0315*** (2.6118)	0.0333*** (2.7738)	0.0034*** (2.7988)	0.0333*** (2.7566)	0.0316*** (2.6096)
ER	6.4831*** (3.2672)	6.1552*** (3.1056)	6.2734*** (3.1215)	6.2043*** (3.1232)	6.3909*** (3.1922)
ICOR	0.1004 (0.7983)	0.0789 (0.6263)	0.1093 (0.8717)	0.0826 (0.6539)	0.0780 (0.6192)
INC	0.3763 (1.2097)	0.3811 (1.2289)	0.2970 (0.9177)	0.3896 (1.2150)	0.3222 (1.0215)
CPI	0.1709*** (8.2743)	0.1738*** (8.4079)	0.1785*** (8.6080)	0.1731*** (8.3544)	0.1734*** (8.3818)
CRI	-1.4813*** (-5.7078)	-1.4312*** (-5.4949)	-1.9240*** (-4.6170)	-1.6974*** (-4.0512)	-1.4125*** (-5.3962)
PCI	0.0411*** (2.7930)	0.0394*** (2.6830)	0.0398*** (2.6529)	0.0385*** (2.5900)	0.0392*** (2.6495)
IIP	-0.5621 (-1.2393)	0.5570 (0.7262)	0.9005 (1.3042)	0.3268 (0.3750)	0.5223 (0.6335)
CR	6.6083 (1.0117)	5.3315 (0.8136)	5.7579 (0.6790)	3.6895 (0.4444)	5.9678 (0.9082)
PR2		-1.0165* (-1.8269)	10.0911 (1.3902)	-2.7059 (-0.5680)	-0.9672 (-1.4315)
FRE	0.8581*** (4.2644)	0.8031*** (4.0065)	1.8764*** (3.7206)	0.8131*** (4.0301)	0.6484*** (2.6346)
BED	-0.5682 (-1.4391)	-0.5776 (-1.4846)	-0.7875 (-1.1581)	-0.5805 (-1.4856)	-0.4344 (-0.8046)
WEB	0.0136 (0.2205)	0.0153 (0.2503)	0.0307 (0.2756)	0.0162 (0.2607)	0.0442 (0.4254)
CRI*PR2			0.6863 (1.6062)	0.3388 (0.8123)	
CR*PR2			-1.9901 (-0.2779)	2.4089 (0.3574)	
FRE*PR2			-1.1294** (-2.1346)		0.0000 (1.1493)
BED*PR2			0.0580 (0.0765)		-0.0001 (-0.4639)
WEB*PR2			-0.0139 (-0.1077)		-0.0525 (-0.4328)
Adjusted R^2	0.304248	0.308457	0.309964	0.30659	0.304772
F-statistic	23.16745***	21.99579***	16.5801***	19.21099***	17.99353***
Periods	11 (2005-2015)	11 (2005-2015)	11 (2005-2015)	11 (2005-2015)	11 (2005-2015)
Cross-sections	60	60	60	60	60
Obs.	660	660	660	660	660

Note: The random effects models are appropriate; Over 2005-2015, Vietnam had new investment and enterprise laws in 2005 (LAW=1) and PCI data were available; FDI is the dependent variable; RS represents EG; FDI, GDP, ER, and INC are natural logarithm values; values in parentheses indicate t-statistics; ***, **, and * denote statistical significance at 1%, 5%, and 10% level, respectively; Obs. stands for the number of observations.
Source: Author's calculations

Table 5.47 FDI Location Selection with a Time Lag at the Vietnam Provincial Level 2005-2015

	Coefficient (Dependent variable: FDI)				
Variable	**Model 48**	**Model 49**	**Model 50**	**Model 51**	**Model 52**
c	-96.6887*** (-4.0280)	-96.3497*** (-4.0159)	-94.9515*** (-3.8510)	-93.7258*** (-3.8656)	-101.5633*** (-4.1468)
EG(-1)	0.6012** (2.3870)	0.6052** (2.4383)	0.6215** (2.4067)	0.5963** (2.3899)	0.5819** (2.2633)
EDU(-1)	0.0306** (2.3328)	0.0315** (2.4041)	0.0300** (2.2721)	0.0312** (2.3720)	0.0310** (2.3438)
ER	7.8355*** (3.6631)	7.8005*** (3.6518)	8.0436*** (3.7289)	7.7789*** (3.6351)	7.9563*** (3.6969)
ICOR	-0.7166*** (-7.8787)	-0.7263*** (-7.8166)	-0.7117*** (-7.6132)	-0.7145*** (-7.6462)	-0.7353*** (-7.8784)
INC	-0.0550 (-0.1683)	-0.0493 (-0.1510)	-0.1092 (-0.3177)	-0.0263 (-0.0780)	-0.1777 (-0.5326)
CPI(-1)	-0.0372** (-2.3843)	-0.0353** (-2.1882)	-0.0377** (-2.3109)	-0.0379** (-2.3178)	-0.0317* (-1.9442)
CRI	-0.2834 (-0.9903)	-0.2848 (-0.9952)	-0.7027 (-1.5795)	-0.7316* (-1.6477)	-0.2581 (-0.8987)
PCI	0.0434*** (2.7903)	0.0430*** (2.7570)	0.0412*** (2.6042)	0.0417*** (2.6447)	0.0443*** (2.7967)
IIP	-1.0833** (-2.2625)	-0.7522 (-0.8796)	-1.2892 (-1.2827)	-1.2143 (-1.2359)	-0.0025 (-0.0025)
CR	29.5729*** (4.6291)	29.4660*** (4.6084)	26.1541*** (3.0434)	26.6180*** (3.1697)	29.1225*** (4.5478)
PR2		-0.2916 (-0.4821)	-3.9330 (-0.7232)	-2.8852 (-0.5700)	4.4560 (1.0024)
FRE	0.8290*** (4.0418)	0.8156*** (3.9963)	0.6343** (2.4843)	0.8318*** (4.0512)	1.5664*** (3.2123)
BED	-0.5677 (-1.4065)	-0.5731 (-1.4399)	-0.4205 (-0.7612)	-0.5787 (-1.4482)	-0.9015 (-1.3033)
WEB	0.0014 (0.0222)	0.0022 (0.0344)	-0.0059 (-0.0505)	0.0041 (0.0637)	-0.0328 (-0.2935)
CRI*PR2			0.5716 (1.2758)	0.5845 (1.3127)	
CR*PR2			5.1152 (0.6777)	3.7255 (0.5216)	
FRE*PR2			0.0000 (1.2931)		-0.8583* (-1.6749)
BED*PR2			-0.0001 (-0.4590)		0.3557 (0.4572)
WEB*PR2			0.0001 (0.0006)		0.0494 (0.3817)
Adjusted R^2	0.240727	0.242655	0.237859	0.241686	0.239825
F-statistic	17.07195***	16.08179***	11.82472***	14.12707***	13.22971***
Periods	11 (2005-2015)	11 (2005-2015)	11 (2005-2015)	11 (2005-2015)	11 (2005-2015)
Cross-sections	60	60	60	60	60
Obs.	660	660	660	660	660

Note: The random effects models are appropriate; Over 2005-2015, Vietnam had new investment and enterprise laws in 2005 (LAW=1) and PCI data were available; FDI is the dependent variable; RS represents EG; FDI, GDP, ER, and INC are natural logarithm values; values in parentheses indicate t-statistics; ***, **, and * denote statistical significance at 1%, 5%, and 10% level, respectively; Obs. stands for the number of observations.
Source: Author's calculations

Table 5.48 Coefficients of the Regressors Related to FDI Location Selection at the Vietnam Provincial Level

Variable group		Variable	Models without a time lag										Models with a time lag									
			2000-2015					2005-2015					2000-2015					2005-2015				
			43	44	45	46	47	48	49	50	51	52	43	44	45	46	47	48	49	50	51	52
Regressors	EG	RS[1]	PS	PS	PS	PS	PS	PS	PS	P	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
	Human capital factor	EDU[1]	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
	Economic factors	ER	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
		ICOR	PS	PS	PS	PS	PS	P	P	P	P	P	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
		INC	N	N	N	N	N	P	P	P	P	P	N	N	N	N	N	N	N	N	N	N
		CPI[1]	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
		CRI	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	P	P	N	N	P	N	N	N	NS	N
	Provincial competition and institutional factors	PCI						PS	PS	PS	PS	PS						PS	PS	PS	PS	PS
		IIP	NS	N	N	N	N	N	P	P	P	P	NS	NS	NS	NS	N	NS	N	N	N	N
		CR	N	N	P	P	P	P	P	P	P	P	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
	Policy and law related factors	PR2		N	PS	P	P		NS	P	N	N		P	P	P	P		N	N	N	P
	Infrastructure factors	FRE	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
		BED	N	N	N	N	P	N	N	N	N	N	N	NS	N	NS	N	N	N	N	N	N
		WEB	P	P	P	P	P	P	P	P	P	P	P	P	N	P	N	P	P	N	P	N
	Interaction terms	CRI*PR2			P	N				P	P				P	P				P	P	
		CR*PR2			N	N				N	P				N	N				P	P	
		FRE*PR2			NS		PS			NS		P			PS		NS			P		NS
		BED*PR2			N		NS			P		N			N		P			N		P
		WEB*PR2			P		N			N		N			P		P			P		P

Note: PS is positive and significant; NS is negative and significant; P is positive and insignificant; N is negative and insignificant; [1] denotes there is a lag term in the variables RS, EDU, CPI in *Models with a time lag*.

Source: Author's calculations

In conclusion, $H_{4.1}$ cannot be rejected because geographical concentration of FDI exists at the provincial level in Vietnam. The determinants of FDI-inflow distribution among provinces and cities are RS, EDU, ER, ICOR, CPI, CRI, PCI, IIP, CR and FRE. The findings agree with the Escobar's (2013) conclusion of the importance of education level, Castiglione et al.'s (2012) finding of the positive role of political stability and security, and Nguyen and Nguyen's (2007) study of the positive link to infrastructure development in selecting investment locations by foreign investors. Table 5.49 summarises the findings of the FDI location selection in Vietnam.

Table 5.49 A Summary of the FDI Location Selection Determinants in Vietnam

No.	Hypothesis	Findings		
		National	Regional	Provincial
$H_{4.1}$	Geographical concentration of FDI exists in certain locations affected by determinants of the FDI-inflow distribution in Vietnam	No	No	Yes
Q4. ***Is there any geographical concentration of FDI in Vietnam?*** 1. Yes, there is evidence of geographical concentration of FDI at the provincial level, but evidence at the regional level was not found. 2. RS, EDU, ER, ICOR, CPI, CRI, PCI, IIP, CR and FRE are the determinants affecting the FDI location selection of foreign investors at the provincial level. 3. The effect of FRE on FDI attraction is weaker in provinces under more difficult socio-economic conditions. The effects of CRI and CR are not different in provinces and cities under different socio-economic conditions.			

5.4 Conclusion

This chapter reports the descriptive statistics and the empirical results. The findings on the relationship between FDI and EG, FDI competition, the effects of policies and laws on FDI, and the FDI location selection are summarised below.

There is a long-term bi-directional positive relationship between FDI and EG at the provincial level in Vietnam. At the regional level, there is a two-way positive nexus between FDI and EG but not in the long term. At the national level, there is long-term and short-term causality from EG to FDI, but an effect of FDI on EG does not exist.

In terms of the PCI-based and IIP-based competition, provinces and cities with better governance (higher PCI) significantly attract more FDI. The PCI sub-indices differently affect FDI provincial competition. Three PCI sub-indices, ENTRY, ACCESS and LEGAL, are more likely to determine investors' decisions where to locate their capital in Vietnam than the other sub-indices (LAND, TIME, CHARGE, PROACT, SUPPORT and LABOUR). Provinces offering higher fiscal incentives (higher IIP index) attract less FDI.

The effects of laws on FDI attraction are insignificant at national and regional levels in Vietnam and the effects are not different among different regions. At the provincial level, the 2005 investment and enterprise laws have had no impact in attracting FDI. However, provincial ranking (PR and PR2) based on the decrees guiding the investment laws has a significant link with FDI attraction at the provincial level; provinces ranked with a higher PR and PR2 (under more difficult socio-economic conditions) attract less FDI. The positive effect of the 2005 laws on FDI decreases in provinces under more difficult socio-economic conditions. Becoming a member of WTO significantly positively affected FDI attraction at the Vietnam provincial level, but FDI was significantly, negatively impacted when Vietnam engaged in more FTAs. The effects of WTO and FTA are not different in the provinces and cities under different socio-economic conditions.

Geographical concentration of FDI exists at the provincial level; there is no the evidence of geographical concentration of FDI at the regional level. RS, representing EG, the human capital factor (EDU), the economic factors (ER, ICOR, CPI and CRI), provincial competition and institution factors (PCI, IIP, and CR) and infrastructure development factor (FRE) are the determinants of FDI location selection of foreign investors at the Vietnam provincial level. The positive effect of FRE on FDI attraction is significantly weaker in provinces under more difficult socio-economic conditions. The impact of CRI and CR on FDI inflows is not different in provinces and cities ranked differently.

Chapter 6

Conclusion

6.1 Introduction

This chapter summarises the thesis. Section 6.2 presents a summary of the study encapsulating the four research questions, the data and methodologies. Section 6.3 discusses the major findings of the study. Section 6.4 presents the implications of the study for academics, foreign investors and policymakers. The study's limitations are discussed in Section 6.5, followed by suggestions for future research in Section 6.6.

6.2 Summary of the Study

FDI attraction has been investigated in many countries including Vietnam because of the economic, political, social, and natural environment effects that FDI capital may bring into a host country. Vietnam has successfully attracted FDI inflows since the 1986 economic reform. To benefit from FDI, the Vietnamese government made concerted efforts to improve the business environment such as passing the first FDI law in 1987, engaging in more FTAs, especially the trade agreement with the US in 2000, becoming a member of WTO in 2007, and reforming the business and investment laws in the 2005 and 2014. The objective of this study was to explore: (i) the FDI and EG relationship, (ii) FDI competition, (iii) the effects of policies on FDI, (iv) the effects of laws on FDI, and (v) the determinants of FDI location selection in Vietnam. The focus was on examining the long-run bi-directional relationship between FDI and EG, analysing the FDI determinants and identifying determinants that affect FDI location selection based on the investors' perspective.

To achieve the study objectives, four research questions, driven by the gaps in the literature, were investigated: "What is the relationship between FDI and EG in the provinces and cities of Vietnam?" (research question 1); "How does PCI-based and IIP-based competition affect FDI at the provincial level in Vietnam?" (research question 2); "Does the rule of law matter in attracting FDI to Vietnam?" (research question 3); and "Is there any geographical concentration of FDI in Vietnam?" (research question 4).

This study made some key contributions to the literature, investment decisions, and policy implications. The literature is enriched by the unified conclusions on the FDI and EG relationship, the PCI-based and IIP-based competition, the effects of policies and laws on FDI, and the FDI location selection at the national, regional, and provincial levels in Vietnam. The study contributes to academia by investigating the long-term bi-directional relationship between FDI and EG at national

and provincial levels in Vietnam. RS is employed instead of GDP to represent EG at regional and provincial levels, which reduces the limitations of the GDP calculation at non-national levels. The PCI-based competition in FDI attraction is explored as the first study that attempts to investigate the effects of not only PCI but also its sub-indices on FDI provincial competition. PR, PR2, RR and RR2 are introduced to rank provinces and regions based on their socio-economic conditions according to Vietnamese laws. The IIP index is used as an aggregate index of three types of investment incentives (free land, income tax exemption, and import tax exemption) to investigate IIP-based competition in FDI attraction. Additionally, the CR and WEB indices are employed to represent political stability and infrastructure development, respectively, to identify FDI determinants affecting the FDI location selection based on the investors' perspective. FDI determinants are identified and analysed at the national, regional, and provincial levels. This study also suggests policies to attract FDI and enhance the effects of FDI in Vietnam.

Chapter 1 defines and classifies FDI based on four alternative views (source country, host country, capital, and investment direction). The chapter presents an overview of the economic, political, social, and natural environment effects of FDI transferred to a host country, of which the economic element has been studied broadly by researchers. However, few studies have focused on the long-term two-way relationship between FDI and EG, especially in Vietnam. Limited studies have identified FDI determinants in selecting investment locations based on the investors' view. In addition, the topics on FDI in Vietnam (the link between FDI and EG, FDI provincial competition, policy effects on FDI, law effects on FDI, and FDI location selection) are investigated separately in different research areas using different data based on different study periods. This study explores the five topics in a single study to extend the cohesive literature on FDI in Vietnam. The chapter concludes with the study objective and four research questions.

Chapter 2 provides an overview of inward FDI to Vietnam. The chapter also gives an overview of Vietnam's socio-economic development, FDI-related laws and regulations, and FDI attraction. Vietnam has some advantages regarding socio-economic development, such as the high rate of labour force of 15 years of age and above, low unemployment rate, and high and steady GDP growth rate compared with the East Asia and Pacific region and the world. However, using capital efficiently, controlling inflation, and administering international trade are the country's concerns. In terms of the FDI attraction, the Vietnamese law and regulation system related to FDI has improved since 1987. Vietnam experienced rapid increases in the number of FDI licensed projects (from 211 in 1988-1990 to 2,120 projects in 2015) and in the annual registered FDI capital (the registered capital in 2015 was 15 times that in 1988-1990). Although FDI has contributed highly to Vietnam's total social investment and exports, the contribution of FDI in creating jobs, increasing the state budget revenue and boosting the EG was quite modest compared with the FDI capital rate in the social investment

structure. Further, the country has faced unequal FDI distribution among economic activities as well as among regions, provinces and cities. Besides, Vietnam has attracted FDI mostly from Asia with a small percentage of FDI from developed countries.

Chapter 3 reviews the literature on inward FDI with worldwide evidence of the relationship between FDI and EG, the determinants of FDI, and the empirical studies related to FDI in Vietnam. The literature review of the FDI-EG nexus shows a lack of studies investigating the long-term, two-way relationship between FDI and EG, especially for Vietnam. The literature review provides inconsistent conclusions on FDI determinants such as trade openness, exchange rate, and inflation, and shows that a limited number of studies explore the determinants of investors' FDI location selection. The literature review on inward FDI to Vietnam shows the five research topics (the relationship between FDI and EG, the FDI provincial competition, the effects of policies on FDI, the effects of laws on FDI, and the FDI location selection) have not been investigated in a single study. Differences in research areas and study periods in the same topic generate inconsistent findings on inward FDI to Vietnam. The chapter develops the hypotheses based on the five research topics to investigate the four research questions.

Chapter 4 describes the research data and methodologies. The chapter begins with the study period and research area. The selection and construction of the dependent and independent variables are also detailed. The literature review suggests the cointegration – OLS – ECM approach to test $H_{1.1}$ on the long-term bi-directional link between FDI and EG at the provincial and national levels. The OLS estimation procedure is applied to test $H_{1.2}$ and $H_{1.3}$ on the relationship between FDI and EG, $H_{2.1}$ and $H_{2.2}$ on the FDI provincial competition and effects of policies, $H_{3.1}$ and $H_{3.2}$ on the effects of laws on FDI, and $H_{4.1}$ on the geographical concentration of FDI in Vietnam. The Hausman test is used to determine whether a fixed or random effects model is appropriate to estimate the Panel OLS regression equations at the regional and provincial levels. The chapter concludes with a discussion of the empirical models employed to answer the four research questions.

Chapter 5 discusses the empirical results. The data description gives an overview of the data at the national, regional, and provincial levels. The study's findings on the relationship between FDI and EG, the PCI-based and IIP-based competition, the effects of laws on FDI, and the factors that determine the FDI location selection are described. The results show the long-term bi-directional positive relationship between FDI and EG at the provincial level in Vietnam. In terms of the PCI-based and IIP-based competition, provinces and cities with better governance (higher PCI) attract significantly more FDI. Provinces offering higher fiscal incentives (higher IIP index) attract less FDI. The effects of laws on FDI attraction are insignificant in Vietnam. However, the ranking of provinces (PR and PR2) based on the decrees guiding the investment laws has a significant link with FDI attraction at the

provincial level. Provinces ranked with higher PR and PR2 (under more difficult socio-economic conditions) attract less FDI. The positive effect of the new laws in 2005 on FDI decreases in provinces with more difficult socio-economic conditions. Geographical concentration of FDI exists at the provincial level and that concentration of FDI at the regional level is mixed. RS representing EG, the human capital factor EDU, the economic factors ER, ICOR, CPI, and CRI, the provincial competition and institution factors PCI, IIP, and CR, and infrastructure development factor FRE are the determinants of FDI location selection by foreign investors at the Vietnam provincial level. The positive effect of FRE on FDI attraction is significantly weaker in provinces with more difficult socio-economic conditions.

6.3 Major Findings

The study focuses on inward FDI at Vietnam's provincial, regional and national levels. The research area comprises six regions with 63 provinces and cities (as at 31 December, 2015). Two annual panel data sets are used at the provincial and regional levels from 2000 to 2015. At the national level, time series data are used. However, to evaluate the long-term relationship between FDI and EG at the national level, the study period is from 1990 to 2015 for the five variables FDI, GDP, OT, ER and POP (see Appendix Table B.10).

There are 38 variables in the study. FDI, RS, and GDP are used as dependent and independent variables in different regression models. Both RS and GDP represent EG; RS represents EG at the provincial and regional levels and GDP represents EG at the national level. The independent variables include three human capital factors, nine economic factors, four infrastructure factors, seven policy and law related factors, and twelve provincial competition and institutional factors. Appendix Table B.11 gives the data definitions and sources.

The results of the relationship between FDI and EG, the PCI-based and IIP-based competition, the effects of laws on FDI, and the determinants of FDI location selection are summarised in Tables 5.29, 5.32, 5.41, and 5.49, respectively.

6.3.1 The Relationship between FDI and EG

Research question 1 was driven by the limited number of empirical studies on the long-term bi-directional relationship between FDI and EG in Vietnam. The knowledge gap is because of the lack of studies on the two-way relationship in the long term at the provincial and national levels and the inconsistent findings of the one-way nexus (including "FDI-to-EG" and "EG-to-FDI") in the literature.

The study used the cointegration – OLS – ECM approach to evaluate the long-term nexus between FDI and EG at the provincial and national levels in Vietnam. The OLS estimation procedure was

applied to test the one-way relationship between FDI and EG at the national, regional, and provincial levels in Vietnam from 2000 to 2015. The OLS procedure was employed at the national level and Panel OLS estimations were used at the regional and provincial levels.

Table 6.1 summarises the results of the long-term relationship between FDI and EG at Vietnam's provincial and national levels. A long-term bi-directional, positive nexus between FDI and EG is found at the provincial level, but does not exist at the national level in Vietnam. In any case, either through endogenous variables or both endogenous and exogenous variables, there is short-term causality from FDI to EG at the provincial level. At the national level, short-term causality from FDI to EG is not found. However, there is a long-term and short-term one-way relationship from EG to FDI in Vietnam from 1990 to 2015.

Table 6.1 The Relationship between FDI and EG Using the Cointegration – OLS – ECM Approach

Cointegration – OLS – ECM approach		**Provincial level**	**National level**
Step 1 (Evaluate the long-term FDI and EG nexus)	***Unit root tests***	*FDI, EG, ER, EDU, POP, and INC*	*FDI, EG, ER, OT, and POP*
		non-stationary at the level and integrated of I(1)	non-stationary at the level and integrated of I(1)
	Cointegration tests	*Pedroni, Kao, and Johansen-Fisher cointegration tests*	*Johansen cointegration test*
		The long-term cointegration link between FDI and EG exists	The long-term cointegration link between FDI and EG exists
Step 2 (Re-evaluate the FDI and EG nexus)	***OLS estimators***	*Panel FMOLS estimators*	*FMOLS estimators*
		Positive FDI ↔ EG is found	FDI ↔ EG does not exist
Step 3 (Investigate the FDI and EG causality direction)	***ECM***	*Panel VEC models*	*VEC models*
		FDI ↔ EG in the long term FDI → EG in the short term	**FDI ↔ EG does not exist** EG → FDI in the long term EG → FDI in the short term

Source: Author's calculations

The FDI-to-EG link from 2000 to 2015 was investigated using the OLS estimators without and with a lag term in FDI, STATE, MKT, SCI, and CPI at the national level, and without and with a lag term in FDI and CPI at the regional and provincial levels. The lag term was adapted from Escobari and Vacaflores (2014) and Nguyen, Ho, et al. (2012). Table 6.2 shows the one-way relationships between FDI and EG at the national, regional, and provincial levels in Vietnam.

The estimated results show that the FDI-to-EG link is strong and positive at the regional level, but does not exist at the national level. At the provincial level, the FDI-to-EG link is significant and positive in the models with FDI, POP and ER regressors. These results confirm the findings of the long-term and short-term causality from FDI to EG using the cointegration-OLS-ECM approach. However, FDI insignificantly impacts EG at the provincial level in Model 20 including POP, ER, ICOR,

INC and CPI (see Tables 5.23 and 5.24). The possible reason that causes the different effects of FDI on EG, is because of unbalanced provincial and regional economic development. Scatterplots of FDI and RS (see Figures 5.4 and 5.5) show the strong positive relationship for the five cities under the non-difficult socio-economic conditions and the weak positive relationship for the five provinces under the extremely difficult conditions. Therefore, the results align with the findings of the Nguyen and Ho's (2013) and Nguyen, Ho, et al.'s (2012) studies of different interactions between FDI and EG in Vietnam's areas under different socio-economic conditions.

Table 6.2 The Relationship between FDI and EG Using the OLS Estimation Procedure

OLS Estimation Procedure	Provincial level	Regional level	National level
FDI-to-EG nexus	Mixed	Yes	No
EG-to-FDI nexus	Yes	Yes	Yes
Conclusion: FDI↔EG	**Yes**	**Yes**	**No**

Source: Author's calculations

The EG-to-FDI link from 2000 to 2015 was examined using the OLS estimators without and with a lag in EG, STATE, MKT, SCI, CPI and EDU at the national level, and without and with a lag in EG, EDU, and CPI at the regional and provincial levels. At the national level, the estimated results show a positive EG-to-FDI nexus is likely to exist, which is consistent with the results of the VEC models of the EG-to-FDI causality at the national level in Vietnam from 1990 to 2015. At the regional and provincial levels, the EG-to-FDI link is positive and significant in both without and with a lag, which supports the findings of the cointegration-OLS-ECM approach of the long-term bi-directional relationship between FDI and EG at Vietnam's provincial level.

6.3.2 PCI-based and IIP-based Competition

Research question 2 was based on limited studies on PCI-based and IIP-based competition in FDI attraction and their inconsistent results. Previous studies on IIP are limited because they focus only on tax incentives (Wei & Li, 2011; Li & Shen, 2008; Sun, 2002) whereas IIP may include grants, tax preferences or holidays, free land or other inputs, and regulatory policy concessions. The previous findings of PCI-based competition in Vietnam are mixed; no study employs PCI sub-indices to investigate the competition factors that attract FDI at the provincial level in Vietnam.

The results of the PCI-based and IIP-based competition in FDI attraction at the provincial level in Vietnam are summarised in Table 6.3. The significant positive link between governance (PCI) and FDI flows existed in Vietnam's provinces and cities during the study period 2005-2015, which aligns with Nguyen and Ho's (2013) and Malesky's (2010) studies. However, only three of nine PCI sub-indices (ENTRY, ACCESS and LEGAL) are more likely to exhibit significant roles in determining FDI flows at the

provincial level. This means not all PCI sub-indices significantly affect FDI in Vietnam, which explains the weak PCI - FDI link found by Nguyen, Ho, et al. (2012) and Nguyen and Nguyen (2007).

Table 6.3 PCI-based and IIP-based Competition at the Provincial Level in Vietnam

Competition in FDI attraction		Without time lag	With time lag
PCI		PS	PS
PCI sub-indices	ENTRY	PS	PS
	LAND	NS	N
	ACCESS	P	PS
	TIME	P	P
	CHARGE	N	P
	PROACT	P	N
	SUPPORT	NS	N
	LABOUR	PS	N
	LEGAL	P	PS
IIP		N	NS

Note: PS is positive and significant; NS is negative and significant; P is positive and insignificant; N is negative and insignificant.
Source: Author's calculations

In terms of IIP-based competition, provinces offering higher fiscal incentives (higher IIP index) attract less FDI in Vietnam during the study period 2000-2015. This implies offering free land, income tax and import tax exemptions is less likely to attract more FDI at the provincial level in Vietnam. The result contrasts with Vu et al.'s (2009) finding of a positive link between sub-national investment incentives and FDI, but aligns with the Vu's (2007) conclusion on the negative effect of incentives on FDI flows in the year after adoption of those incentives in Vietnam.

6.3.3 The Effects of Laws on FDI

Research question 3 was driven by the limited studies on the effects of laws on FDI at the non-national level in Vietnam. 'Law effects' refers to not only to the impacts of the new investment and enterprise laws in 2005 and WTO membership in 2007 on FDI, but also to the effects of participation in FTAs on FDI flows over the study period 2000-2015, which has not previously been investigated.

The results of the effects of laws on FDI in Vietnam are summarised in Table 6.4. The effects of laws (LAW, WTO, and FTA) on FDI attraction are insignificant at regional and national levels, and are not different for regions ranked differently based on the socio-economic conditions (extremely difficult, difficult, and neither extremely difficult nor difficult condition) regulated in the Vietnamese investment laws (Government, 2006; Government, 2000). The insignificant effect of WTO on FDI at the national level does not align with the findings of Nguyen, Zhang, et al. (2012) and Pham (2011). This may be because the study periods after Vietnam joined the WTO are limited in the Nguyen, Zhang, et al. (2012) and Pham (2011) studies (three years, 2008 to 2010, and one year, 2008, respectively), whereas it is longer in this study (eight years from 2008 to 2015).

Table 6.4 The Effects of Laws on FDI at Vietnam's Provincial, Regional and National Levels

Effects of Laws		Without a time lag			With a time lag		
		Provincial	**Regional**	**National**	**Provincial**	**Regional**	**National**
LAW		PS	P	N	PS	P	N
WTO		PS	N	P	PS	P	P
FTA		NS	P	P	NS	P	P
Different effects in different areas	LAW	**Yes**	No		**Yes**	No	
	WTO	No	No		No	No	
	FTA	No	No		No	No	

Note: PS is positive and significant; NS is negative and significant; P is positive and insignificant; N is negative and insignificant.
Source: Author's calculations

The release of new investment and enterprise laws in 2005 significantly, positively impacted FDI at the provincial level, especially in first ranked provinces without difficult socio-economic conditions. This agrees with the Nguyen, Zhang, et al.'s (2012) finding of a positive impact of the 2005 new laws on inward FDI. The positive effect of 2005 new laws on FDI decreases in provinces under more difficult socio-economic conditions. The results also show the FTA and WTO memberships significantly affect FDI attraction at Vietnam's provincial level. However, the effects of WTO and FTA are not different for provinces and cites ranked differently.

6.3.4 The Determinants of FDI Location Selection

Research question 4 identifies the geographical concentration of foreign investors in Vietnam based on the determinants of the FDI-inflow distribution. Investors' subjective decisions in choosing the investment location are important to EG and development of host countries. However, few studies have focused on this topic for Vietnam. Different studies have found different determinants of FDI distribution such as improved democracy (Hasan & Mahvash, 2015), lower delinquency rates (Escobar, 2013), and political stability and security (Castiglione et al., 2012).

The results are shown in Table 6.5. There is evidence of geographical concentration of FDI in Vietnam, especially at the provincial level. The determinants of FDI-inflow distribution among provinces and cities are RS, EDU, ER, ICOR, CPI, CRI, PCI, IIP, CR and FRE. The effect of FRE on FDI attraction is weaker in provinces with more difficult socio-economic conditions. There are no differences in the effects of CRI and CR on FDI attraction to provinces and cities ranked differently. The results imply that investors tend to invest more into areas with higher EG, a better educated labour force, lower value currency, more efficient capital use, lower inflation rate (in the previous year), better governance, fewer investment incentives and better infrastructure. The findings agree with the Escobar's (2013) conclusion of the importance of education level, Castiglione et al.'s (2012) finding of the positive role of political stability and security, and Nguyen and Nguyen's (2007) study

of the positive link to infrastructure development in selecting investment locations by foreign investors.

Table 6.5 The Determinants of FDI Location Selection in Vietnam

Variable groups	Variables	Without a time lag				With a time lag			
		Provincial		Regional	National	Provincial		Regional	National
		00-15	05-15	00-15	00-15	00-15	05-15	00-15	00-15
EG	EG[1]	PS	P	P	P	PS	PS	P	N
Human capital factor	EDU[1]	PS	PS	P	P	PS	PS	PS	PS
Economic factors	ER	PS	PS	P	N	PS	PS	N	N
	ICOR	PS	P	N	P	NS	NS	NS	NS
	INC	N	P	P	N	N	N	P	PS
	CPI[1]	PS	PS	PS	P	NS	NS	N	N
	STATE[1]				N				P
	CRI	NS	NS	N	P	N	N	P	PS
Provincial competition and institutional factors	PCI		PS				PS		
	IIP	N	P			NS	N		
	CR	P	P	P	N	PS	PS	P	PS
Policy and law related factors	PR2	PS	P			P	N		
	RR2			N				N	
Infrastructure factors	COM				N				P
	FRE	PS	PS	N	N	PS	PS	N	NS
	BED	N	N	NS	P	N	N	N	NS
	WEB	P				N			
Different effects in different areas	CRI	No	No	No		No	No	No	
	CR	No	No	No		No	No	No	
	FRE	**Yes**	**Yes**	No		**Yes**	No	No	
	BED	No	No	No		No	No	No	
	WEB	No	No			No	No		

Note: PS is positive and significant; NS is negative and significant; P is positive and insignificant; N is negative and insignificant. [1] denotes there is a lag term in the variables in the case with a time lag. PCI data are not available before 2005 at the provincial level; the determinants of FDI location selection are investigated over two study periods 00-15 and 05-15 indicating 2000-2015 and 2005-2015, respectively.
Source: Author's calculations

6.4 Implications of the Study

The findings of this study have several implications for academics, foreign investors, and Vietnam's policymakers.

6.4.1 Academic Implications

First, the study contributes to academia by enriching the literature and providing cohesive conclusions on inward FDI to Vietnam in five research topics (the FDI and EG relationship, PCI-based and IIP-based competition, the effects of policies and laws on FDI, and FDI location selection). To

date, no empirical study has focused on these five research topics at the national, regional, and provincial levels in Vietnam in a single study.

Second, the study findings fill the literature gap on the long-term bi-directional relationship between FDI and EG at provincial and national levels in Vietnam. At the provincial level, there is a long-term positive bi-directional nexus between FDI and EG from 2000 to 2015. However, a long-term positive two-way nexus between FDI and EG is not found from 1990 to 2015 at the national level. The results contrast with Srinivasan et al.'s (2010) findings of the existence of a long-run two-way nexus between FDI and EG in Vietnam from 1991 to 2007. This is because the short-term and long-term changes of FDI may have had marginal effects on the EG changes in Vietnam, which aligns with Wei and Li's (2011) findings of the less important role of FDI in promoting EG. However, short-term and long-term changes in EG significantly positively affect FDI changes.

In addition, the findings extend the literature on the investigation of a one-way nexus between FDI and EG at national, regional, and provincial levels in Vietnam. The FDI-to-EG relationship is not found at the national level, which follows the findings for other countries such as China (Wei & Li, 2011), Brunei and Laos (Srinivasan et al., 2010). The findings on the FDI-to-EG nexus (EG with FDI, POP and ER regressors) at the provincial level, 2000-2015, closely follow Hoang et al.'s (2010) findings of a strong and positive FDI-to-EG nexus in Vietnamese provinces, 1995-2006. However, the FDI-to-EG relationship is different for provinces and cities with different socio-economic conditions, and is less significant with the inclusion of ICOR, INC and CPI in the regression models. The findings of differences in the FDI-to-EG relationship align with the findings by Nguyen and Ho (2013), Wen (2013), Nguyen, Ho, et al. (2012), and Nguyen, Zhang, et al. (2012). The less important effect of FDI on EG at the provincial level is consistent with Wei and Li's (2011) study. The EG-to-FDI nexus is found at national and provincial levels in Vietnam. The result aligns with the existence of an EG-to-FDI nexus at the national level (Labes, 2015; Omri & Kahouli, 2014; Razmi & Behname, 2012; Wei & Li, 2011; Li & Shen, 2008; Thanyakhan, 2008; Sun, 2002), and at the provincial level (Nguyen & Ho, 2013; Nguyen, Ho, et al., 2012). The FDI-to-EG and EG-to-FDI links are positive and significant at the regional level in Vietnam from 2000 to 2015. Therefore, the results support the findings in Nguyen and Ho (2013) of a positive two-way nexus between FDI and EG in Vietnamese regions from 2001 to 2010.

Third, the study suggests academia employs RS[36] instead of GDP to represent EG at non-national levels, especially at the regional and provincial levels in Vietnam. This is because RS reduces the limitations of the GDP calculation at the non-national levels. Also, employing RS is based on the

[36] RS was used to represent EG in Mukherjee (2014) and Jude and Masca (2009).

evidence of a high correlation between GDP and RS at the national level for Vietnam from 1990 to 2015 (see Appendix Table B.2).

Fourth, the study bridges the literature gap about using PCI and its sub-indices to investigate PCI-based competition in FDI attraction. To date, no empirical study has used the PCI sub-indices to explain the reasons for the mixed results in the relationship between governance and FDI attraction in Vietnam. This study's findings show that three of nine PCI sub-indices (ENTRY, ACCESS and LEGAL) significantly affect FDI at the provincial level, which provides an explanation for the weak PCI-FDI link found by Nguyen, Ho, et al. (2012) and Nguyen and Nguyen (2007).

Fifth, the findings extend the literature on the law effects including LAW, WTO and FTA on FDI attraction in Vietnam. The FTA effects have not been previously studied; the study findings show the WTO membership and FTAs significantly affect FDI attraction at the provincial level in Vietnam. However, there are no differences on the effects of WTO and FTA in provinces and cities ranked differently. The study's result of a positive impact of the 2005 investment and enterprise laws on inward FDI is similar to Nguyen, Zhang, et al.'s (2012) finding. The positive effect of the 2005 new laws on FDI decreases in provinces with more difficult socio-economic conditions.

Sixth, the study contributes to the literature on the ranking of provinces and regions in Vietnam, proposing the IIP, CR, and WEB indices to identify FDI determinants that affect FDI location selection based on the investors' perspective. PR, PR2, RR and RR2 are introduced to rank provinces and regions based on their socio-economic conditions (extremely difficult, difficult, and non-difficult) according to the Vietnamese law (Government, 2006; Government, 2000). The IIP index is proposed as an aggregate index of three types of investment incentives (free land, income tax exemption, and import tax exemption). Therefore, this study expands the conclusion about IIP-based competition in FDI attraction so that it is not limited to tax incentives (Wei & Li, 2011; Li & Shen, 2008; Sun, 2002). The results show that free land, income tax and import tax exemptions are not FDI attractive factors. The CR and WEB indices are proposed to represent political stability and infrastructure development, respectively. CR positively affects the FDI location selection, which aligns with the findings by Castiglione et al. (2012) that the political stability is an important institutional factor attracting investors' interest. Our study shows that WEB insignificantly affected FDI attraction into Vietnam from 2000 to 2015. This may imply that the first regulation on online information and public services on the Vietnamese official websites in 2011 (Government, 2011) has not had a positive effect on the quality of electronic portals. Foreign investors may not access these electronic portals to make investment decisions. Therefore, the effects of WEB may need to be re-investigated.

6.4.2 Implications for Foreign Investors

The study findings also have implications for foreign investors. This study found that RS, EDU, ER, ICOR, CPI, CRI, PCI, IIP, CR and FRE are the determinants of FDI-inflow distribution in Vietnam. Based on these results, foreign investors may consider investing more into areas with higher EG, a better educated labour force, lower value currency, more efficient capital use, lower inflation rate (in the previous year), better governance, fewer investment incentives, less political risk and better infrastructure.

Also, provinces ranked with a higher PR (i.e., with more difficult socio-economic conditions) attract less FDI. The effects of FRE and LAW on FDI attraction are weaker in provinces with more difficult socio-economic conditions. Therefore, ranking provinces and regions using PR, PR2, RR, and RR2 proposed in this study, is a source of information for foreign investors to evaluate investment environments. In addition, investors should seek greater breakdown of information from the PCI by evaluating its sub-indices, especially ENTRY, ACCESS and LEGAL, before making investment decisions.

Interestingly, the study's findings show an increase in FDI flows into Vietnam after the 2008 global financial crisis (see Table 5.42). This implies that foreign investors chose Vietnam as their investment destination after the crisis to take advantage of a lower value currency and lower costs offered in areas with high IIP (free land and tax exemption). The study results on the effects of laws on FDI suggest that the changes to laws and the Vietnam's WTO and FTA memberships may not be important at the national and regional levels, but they have significant impacts on investment decisions at Vietnam's provincial level.

6.4.3 Policy Implications

The study's findings show a less important role of FDI in promoting EG in Vietnam. Foreign investors are more likely to invest in provinces and cities with better governance (higher PCI) and are less likely to invest in areas offering higher fiscal incentives (higher IIP index). This implies that the IIP, including free land, income tax and import tax exemptions, has not been very successful in enhancing FDI competition at the provincial level in Vietnam. Foreign investors value good economic governance as a positive factor in the local investment environment and do not highly consider low cost of land and tax in selecting investment locations. The study results suggest policymakers should focus on improving the investment environment to assist the foreign investors to start businesses, better access to information, and solutions to legal matters instead of offering more investment incentives. This study shows that especially assisting investors to start a business is likely to be the most important PCI sub-index. This is because the ENTRY coefficient highly contributed to better governance and strongly associated with higher FDI at the provincial level in Vietnam from 2005 to

2015. Vietnamese state bodies may focus on improving the quality of their official websites (WEB) to reduce difficulties encountered by foreign investors using the electronic portals.

The results on the other determinants of FDI-inflow distribution in Vietnam (RS, EDU, ER, ICOR, CPI, CR and FRE) suggest that Vietnamese policymakers and provincial governments should invest more in education and training, controlling the exchange and inflation rates, enhancing investment efficiency, maintaining political stability and security, and improving infrastructure to boost EG.

In addition, the positive effects of FRE and LAW on FDI attraction decrease in provinces with more difficult socio-economic conditions. Therefore, this may enlighten Vietnam's policymakers about investing more in infrastructure development and law improvement in areas with difficult and extremely difficult socio-economic conditions. This investment strategy is necessary to make the areas more attractive than non-difficult areas, and to reduce the FDI distribution inequality among regions, provinces and cities. Such an investment strategy may result in less inequality of development and income in Vietnam. The study findings also show the significant effects of the Vietnam's WTO and FTA memberships on FDI attraction at the provincial level. This implies that the Vietnamese government may consider national law and agreement improvement to enshrine international commitments such as guaranteeing equality between foreign and domestic firms.

6.5 Limitations of the Study

This study has several limitations associated with data collection and construction. The limitations are:

- The study captured data only from 2000 to 2015 to examine the long-term relationship between FDI and EG at the provincial level in Vietnam but the long-term nexus at the national level covered a longer period, 1990-2015. No data are available between 1990 and 1999 at the provincial level (see Appendix Table B.10). In addition, the long-term nexus between FDI and EG at the regional level has not been investigated. Therefore, a longer study period such as 2000-2019 (20 years) may be considered to investigate the long-term relationship between FDI and EG at Vietnam's provincial and regional levels in future study.
- This study constructed WEB to represent the ability to access information at the provincial level instead of using the number of telephone and internet subscribers from Vietnam's GSO at the national level because of data limitation. The WEB construction is limited because of non-yearly evaluation. WEB was evaluated only twice, in 2011 and 2016. Therefore, the estimates may not be reliable year by year and the findings may not be reported correctly.
- The construction of the IIP index has several limitations. The index includes only three types of investment incentive (free land, income tax exemption, and import tax exemption),

whereas grants, tax holidays, policy concessions, etc., are also considered FDI incentives. The IIP index was based on coefficients indicating important levels of free land, income and import tax exemptions. The coefficients were based on the average rates of revenue from land and houses, revenue from FDI enterprises, and export and import duties in the State budget revenue final accounts in Vietnam from 2000 to 2015, not from the foreign investors' perspective. Foreign investors may have different evaluations of how important the impacts of investment incentives on their FDI location selections are. This may result in different data for the IIP index and different conclusions on IIP-based competition in FDI attraction at the Vietnam's provincial level.

- The PCI-based competition in FDI attraction in this study was restricted to only 11 years (2005-2015) because no data are available before 2005. Hence, the study results captured PCI-based competition only during the post-2004 period when Vietnam became a member of WTO.
- This study used only the political risk index to investigate the effects of institutional factors on FDI location in Vietnam. Institutional factors may also include low delinquency rates. Therefore, the findings may not represent the effects of all institutional factors that determine FDI-inflow distribution.
- In the panel cointegration tests at the provincial level, trends were not included (see the notes of Tables 5.8 and 5.9) because of unclear trends of FDI and economic growth at the regional level (see Figure 5.2) and at the provincial level (see Figures C.3-C.8 in Appendix C). In case any trends exist, excluding trends is another limitation of the study.
- To investigate the bi-directional relationships between FDI and EG, it is normally expected that the Panel FMOLS regression estimators where FDI or EG is the dependent variable include the same regressors. However, this study employed different regressors for each dependent variable. Table 5.11 shows the estimation of FDI with three variables including EG, ER, and EDU, while Table 5.12 presents the estimation of EG with four variables including FDI, ER, INC, and POP. This would be one of the study limitations although the implication of research is for the two variables, FDI and EG.
- In terms of the Johansen Cointegration test (see Table 5.16), although the results show that there are at least 4 cointegrating vectors, the study emphasised on the cointegrating vectors of EG and FDI. Therefore, instead of showing 4 ECM terms, only ECM terms of FDI and EG were presented. This would be the other limitation of the study that restricts the interpretation of the VEC.

- Using only the Panel FMOLS estimator may not provide a good robustness analysis. Employing two different methods such as the Panel FMOLS and Panel DOLS estimators could increase the confidence on the obtained results. Both FMOLS and DOLS estimators account for potential endogeneity and serial correlation, thus they are asymptotically unbiased and normally distributed. Thus, they do not require exogeneity assumptions. The FMOLS is a non-parametric approach, while the DOLS is a parametric approach using lags and leads. The DOLS estimator can account for forms of cross-sectional dependence as it allows time-demeaning data. In addition, the group-mean Panel DOLS estimator is super consistent under cointegration, and is robust to the omission of variables that do not form part of the cointegrating relationship.

6.6 Suggestions for Future Research

Future research should expand the sample size to investigate the long-term relationship between FDI and EG at provincial, regional, and national levels in Vietnam. PCI-based competition in FDI attraction should be captured during a longer study period to discover the longer impacts of governance at Vietnam's provincial level.

A future study should consider obtaining the number of telephone and internet subscribers from GSO for Vietnam's provinces and cities to get more reliable data representing communication development. This means hand-collected data are required because data are not available online. The data collected would be yearly to measure the impact of communication development not only at the national level but also at provincial and regional levels. Future research may also examine the reliability of WEB with evaluations in 2020 onwards.

Regarding the IIP-based competition in FDI attraction, future research should include a wider range of investment incentives such as grants, holidays, policy concessions. In addition, future study should consider different techniques to construct the IIP index. A possible way is to use surveys to obtain the coefficients indicating important levels of investment incentives from investors. These data would improve the IIP index and enable future research to investigate the IIP-based competition in FDI attraction based on the investors' evaluations.

Future research should include data on delinquency rates to investigate the effects of that institutional factor on FDI location in Vietnam. These data would enrich the study on the determinants of FDI location selection from foreign investors' point of view. Future study may also use questionnaires to get responses from investors rather than from a third hand data source (PRS).

In terms of the panel cointegration tests, as a note for future research, trends (with individual intercepts) would be considered for the panel cointegration tests. Although unclear trends of FDI and retail sales of good and services were found at the regional and provincial levels, including trends in the panel cointegration tests would enhance the analysis on the long-run bi-directional relationship between FDI and EG in case any trends exist.

In order to enhance the quality of the research, it is no doubt that at least 4 ECM terms should be investigated for a good publication of the long-run two-way relationship between FDI and EG at the provincial and national level in Vietnam. To provide a good robustness analysis, future researches should employ two different methods such as the Panel FMOLS and Panel DOLS estimators, and use the Wooldridge (2002) robust version of Hausman test to choose fixed-effects or random-effects based on the robust test.

Breusch-Pagan Lagrange Multiplier (LM) test of independence and Parasan Cross-sectional Dependence (CD) test are used to test for cross-sectional dependence or contemporaneous correlation. According to Baltagi (2008), cross-sectional dependence is a problem in macro panel with long time series (T is over 20-30 years) and not a big problem in micro panels (few T and large N). Based on the Baltagi's (2008) discussion, the panel data used in our study is not a macro panel (as T equals 16 years). Therefore, the cross-sectional dependence may not be a great issue in our study. However, it is still worth to test using either the Breusch-Pagan LM or Parasan CD tests in future studies.

Appendix A

Basic Social-Economic Statistics of Vietnam

Table A.1 The Total Population and Yearly Population Growth Rate in Vietnam 1950-2016

Year	Population	Yearly population growth rate (%)	Year	Population	Yearly population growth rate (%)
1950	24,809,903	-	1984	59,653,092	2.36
1951	25,364,453	2.24	1985	61,049,370	2.34
1952	25,976,838	2.41	1986	62,459,557	2.31
1953	26,646,172	2.58	1987	63,881,296	2.28
1954	27,370,699	2.72	1988	65,313,709	2.24
1955	28,147,785	2.84	1989	66,757,401	2.21
1956	28,973,873	2.93	1990	68,209,604	2.18
1957	29,844,533	3.00	1991	69,670,620	2.14
1958	30,754,603	3.05	1992	71,129,537	2.09
1959	31,698,436	3.07	1993	72,558,986	2.01
1960	32,670,623	3.07	1994	73,923,849	1.88
1961	33,666,768	3.05	1995	75,198,975	1.72
1962	34,684,164	3.02	1996	76,375,677	1.56
1963	35,722,092	2.99	1997	77,460,429	1.42
1964	36,780,984	2.96	1998	78,462,888	1.29
1965	37,860,014	2.93	1999	79,399,708	1.19
1966	38,959,335	2.90	2000	80,285,563	1.12
1967	40,074,695	2.86	2001	81,123,685	1.04
1968	41,195,833	2.80	2002	81,917,488	0.98
1969	42,309,662	2.70	2003	82,683,039	0.93
1970	43,407,291	2.59	2004	83,439,812	0.92
1971	44,485,910	2.48	2005	84,203,817	0.92
1972	45,549,487	2.39	2006	84,979,667	0.92
1973	46,604,726	2.32	2007	85,770,717	0.93
1974	47,661,770	2.27	2008	86,589,342	0.95
1975	48,729,397	2.24	2009	87,449,021	0.99
1976	49,808,071	2.21	2010	88,357,775	1.04
1977	50,899,504	2.19	2011	89,321,903	1.09
1978	52,015,279	2.19	2012	90,335,547	1.13
1979	53,169,674	2.22	2013	91,378,752	1.15
1980	54,372,518	2.26	2014	92,423,338	1.14
1981	55,627,743	2.31	2015	93,447,601	1.11
1982	56,931,822	2.34	September 22, 2016	94,444,200	1.07
1983	58,277,391	2.36			

Source: Data collected from Worldometers (2016)

Table A.2 Unemployment Rates in Vietnam, East Asia and the Pacific and the World 2000-2014

Year	Vietnam (%)	East Asia & Pacific (%)	World (%)
2000	2.30	4.66	6.36
2001	2.80	4.88	6.36
2002	2.10	4.88	6.49
2003	2.30	4.84	6.45
2004	2.10	4.85	6.31
2005	2.10	4.67	6.16
2006	2.30	4.51	5.90
2007	2.30	4.22	5.48
2008	2.40	4.56	5.69
2009	2.60	4.63	6.25
2010	2.60	4.40	6.11
2011	2.00	4.32	5.99
2012	1.80	4.38	5.99
2013	2.20	4.47	5.99
2014	2.30	4.52	5.93

Source: Data collected from the WB (2016c)

Table A.3 The Total Capital by Type of Ownership and GDP in Vietnam 1995-2015

Unit: Billion VND (at current prices)

Year	Capital by type of ownership				GDP
	Total	State	Non-state	Foreign	
1995	72,447	30,447	20,000	22,000	228,892
1996	87,394	42,894	21,800	22,700	272,036
1997	108,370	53,570	24,500	30,300	313,623
1998	117,134	65,034	27,800	24,300	361,017
1999	131,171	76,958	31,542	22,671	399,942
2000	151,183	89,417	34,594	27,172	441,646
2001	170,496	101,973	38,512	30,011	481,295
2002	200,145	114,738	50,612	34,795	535,762
2003	239,246	126,558	74,388	38,300	613,443
2004	290,927	139,831	109,754	41,342	715,307
2005	343,135	161,635	130,398	51,102	914,001
2006	404,712	185,102	154,006	65,604	1,061,565
2007	532,093	197,989	204,705	129,399	1,246,769
2008	616,735	209,031	217,034	190,670	1,616,047
2009	708,826	287,534	240,109	181,183	1,809,149
2010	830,278	316,285	299,487	214,506	2,157,828
2011	924,495	341,555	356,049	226,891	2,779,880
2012	1,010,114	406,514	385,027	218,573	3,245,419
2013	1,094,542	441,924	412,506	240,112	3,584,262
2014	1,220,724	486,804	468,513	265,407	3,937,856
2015	1,367,200	519,500	529,600	318,100	4,192,862

Source: Data collected from GSO (2016i) and GSO (2016j)

Table A.4 The GDP Growth Rate of Vietnam, East Asia and the Pacific and the World 2000-2015

Year	Vietnam (%)	East Asia & Pacific (%)	World (%)
2000	6.79	4.64	4.33
2001	6.19	2.69	1.97
2002	6.32	3.73	2.18
2003	6.90	4.37	2.90
2004	7.54	5.25	4.46
2005	7.55	4.92	3.82
2006	6.98	5.71	4.38
2007	7.13	6.71	4.31
2008	5.66	3.58	1.84
2009	5.40	1.32	-1.68
2010	6.42	7.27	4.35
2011	6.24	4.52	3.13
2012	5.25	4.72	2.48
2013	5.42	4.51	2.40
2014	5.98	4.00	2.63
2015	6.68	3.89	2.47

Source: Data collected from the WB (2016b)

Table A.5 The Capital Growth Rate and ICOR of Vietnam 2000-2015

Year	Total capital		GDP	ICOR
	Billion VND	Growth rate (%)	Billion VND	
t	I_t	$r_t = \frac{I_t - I_{t-1}}{I_{t-1}} \times 100$	GDP_t	$ICOR_t = \frac{I_t}{GDP_t - GDP_{t-1}}$
1999	131,171	-	399,942	-
2000	151,183	15.26	441,646	3.63
2001	170,496	12.77	481,295	4.30
2002	200,145	17.39	535,762	3.67
2003	239,246	19.54	613,443	3.08
2004	290,927	21.60	715,307	2.86
2005	343,135	17.95	914,001	1.73
2006	404,712	17.95	1,061,565	2.74
2007	532,093	31.47	1,246,769	2.87
2008	616,735	15.91	1,616,047	1.67
2009	708,826	14.93	1,809,149	3.67
2010	830,278	17.13	2,157,828	2.38
2011	924,495	11.35	2,779,880	1.49
2012	1,010,114	9.26	3,245,419	2.17
2013	1,094,542	8.36	3,584,262	3.23
2014	1,220,724	11.53	3,937,856	3.45
2015	1,367,200	12.00	4,192,862	5.36

Source: Capital growth rate and ICOR computed by the author based on data from GSO (2016i) and GSO (2016j)

Table A.6 The GDP per Capita and CPI-based Inflation Rates of Vietnam, the Middle Income Group Countries and the World 2000-2015

Year	GDP per capita (current US$)			CPI-based inflation rates (annual %)		
	Vietnam	Middle Income	World	Vietnam	Middle Income	World
2000	433.33	1212.57	5448.71	-1.71	4.80	3.63
2001	448.88	1214.93	5348.03	-0.43	5.39	3.99
2002	477.11	1259.52	5485.18	3.83	5.22	3.07
2003	530.86	1402.27	6083.80	3.22	5.30	3.30
2004	606.90	1640.89	6769.32	7.76	5.02	3.63
2005	699.50	1931.14	7237.16	8.28	5.63	4.25
2006	796.67	2269.66	7744.76	7.39	6.19	4.49
2007	919.21	2784.62	8625.65	8.30	6.49	5.34
2008	1164.61	3298.65	9340.89	23.12	10.54	8.95
2009	1232.37	3182.66	8746.66	7.05	4.20	3.04
2010	1333.58	3848.12	9481.63	8.86	5.00	3.55
2011	1542.67	4477.33	10395.90	18.68	6.24	5.00
2012	1754.55	4708.56	10498.46	9.09	4.56	3.85
2013	1907.56	4928.73	10650.83	6.59	4.83	2.70
2014	2052.32	5023.49	10757.29	4.09	3.94	2.66
2015	2111.14	4667.56	9995.55	0.63	3.06	1.44

Source: Data collected from the WB (2016c)

Table A.7 Exports and Imports in Vietnam, East Asia and the Pacific and the World 2000-2015

Year	Exports of goods and services (% of GDP)			Imports of goods and services (% of GDP)		
	Vietnam	East Asia & Pacific	World	Vietnam	East Asia & Pacific	World
2000	49.97	27.41	26.26	53.28	25.04	25.34
2001	51.00	26.47	25.53	52.69	24.44	24.93
2002	50.58	27.25	25.50	57.25	24.90	24.58
2003	52.47	29.62	26.00	62.64	27.22	25.24
2004	54.90	32.69	27.58	67.36	30.28	26.81
2005	63.70	34.62	28.74	67.02	31.40	27.78
2006	67.72	36.32	29.98	70.60	32.23	28.89
2007	70.52	36.48	30.18	84.09	31.80	29.20
2008	70.34	36.20	30.79	83.98	32.98	30.32
2009	62.97	29.88	26.55	73.34	26.74	25.95
2010	72.00	32.63	28.93	80.22	29.61	28.26
2011	79.39	33.55	30.62	83.52	31.82	30.18
2012	80.03	32.71	30.72	76.53	31.40	30.19
2013	83.63	32.45	30.54	81.47	31.46	29.95
2014	86.40	32.38	30.36	83.13	31.18	29.82
2015	89.78	29.94	29.27	88.99	27.64	28.66

Source: Data collected from the WB (2016c)

Table A.8 FDI Projects Licensed by Provinces or Cities in Vietnam (accumulation of projects as at 31 December, 2015)

Cities or Provinces	Number of projects	Total registered capital[37] (Million USD)	Cities or Provinces	Number of projects	Total registered capital (Million USD)
Total	**20069**	**281882.5**	Da Nang city	373	4023.5
Region 1. NMMA	**617**	**13369**	Quang Nam	136	5525.8
Lai Chau	3	4	Quang Ngai	47	4274.5
Dien Bien			Binh Dinh	59	1761.8
Son La	9	134.1	Phu Yen	52	4764.9
Hoa Binh	44	510.6	Khanh Hoa	95	2349.4
Cao Bang	24	51.2	Ninh Thuan	34	949.6
Lang Son	36	207	Binh Thuan	117	3527.9
Bac Giang	229	2459	**Region 4. CH**	**131**	**781.7**
Thai Nguyen	100	7116.5	Kon Tum	2	70.2
Bac Kan	6	14.3	Gia Lai	5	9.7
Ha Giang	7	1029	Dak Lak	13	200.3
Tuyen Quang	6	164.5	Dak Nong	6	19.6
Phu Tho	101	632.8	Lam Dong	105	481.9
Lao Cai	30	838.6	**Region 5. SE**	**10686**	**122544.5**
Yen Bai	22	207.4	Tay Ninh	237	3146.3
Region 2. RRD	**6186**	**72257.9**	Binh Phuoc	160	1213.1
Ha Noi city	3467	25490.9	Binh Duong	2731	24026
Ha Tay			Dong Nai	1350	24025.9
Hai Phong city	513	11651.3	Ba Ria - Vung Tau	322	27766.4
Hai Duong	376	7385.2	Ho Chi Minh city	5886	42366.8
Hung Yen	372	3443.5	**Region 6. MRD**	**1162**	**16867.7**
Ninh Binh	51	1206.5	Long An	760	5406
Thai Binh	61	472.5	Tien Giang	78	1532.5
Ha Nam	165	1438.5	Ben Tre	55	591.1
Nam Dinh	81	679	Tra Vinh	27	2684.1
Bac Ninh	721	11328.3	Vinh Long	27	234.2
Vinh Phuc	268	3781.5	Dong Thap	17	105.5
Quang Ninh	111	5380.7	An Giang	27	204
Region 3. NCCA	**1236**	**53278**	Kien Giang	38	2957.6
Thanh Hoa	71	10409.1	Can Tho city	74	799.2
Nghe An	69	1640.6	Hau Giang	20	1351.2
Ha Tinh	64	11265	Soc Trang	13	118.6
Quang Binh	12	109.1	Bac Lieu	17	94.2
Quang Tri	21	85.6	Ca Mau	9	789.5
Thua Thien Hue	86	2591.2	**Oil and Gas**	**51**	**2783.7**

Source: Data collected from GSO (2016h) and GSO (2015d)

[37] Includes supplementary capital to licensed projects in previous years; Lai Chau province's data includes Dien Bien province's data; Ha Noi city's data includes Ha Tay province's data.

Appendix B

Methodology and Data

Table B.1 The Vietnam Administrative Units at the Provincial Level as at 31 December, 2015

Count	No.	Code	Cities or Provinces	Count	No.	Code	Cities or Provinces
	I	**Region 1. NORTHERN MIDLANDS AND MOUNTAIN AREAS**		32	7	III48	**Da Nang city**
1	1	I02	Ha Giang	33	8	III49	Quang Nam
2	2	I04	Cao Bang	34	9	III51	Quang Ngai
3	3	I06	Bac Kan	35	10	III52	Binh Dinh
4	4	I08	Tuyen Quang	36	11	III54	Phu Yen
5	5	I10	Lao Cai	37	12	III56	Khanh Hoa
6	6	I15	Yen Bai	38	13	III58	Ninh Thuan
7	7	I19	Thai Nguyen	39	14	III60	Binh Thuan
8	8	I20	Lang Son		**IV**	**Region 4. CENTRAL HIGHLANDS**	
9	9	I24	Bac Giang	40	1	IV62	Kon Tum
10	10	I25	Phu Tho	41	2	IV64	Gia Lai
11	11	I11	Dien Bien	42	3	IV66	Dak Lak
12	12	I12	Lai Chau	43	4	IV67	Dak Nong
13	13	I14	Son La	44	5	IV68	Lam Dong
14	14	I17	Hoa Binh		**V**	**Region 5. SOUTH EAST**	
	II	**Region 2. RED RIVER DELTA**		45	1	V70	Binh Phuoc
				46	2	V72	Tay Ninh
15	1	II01	**Ha Noi city**	47	3	V74	Binh Duong
16	2	II26	Vinh Phuc	48	4	V75	Dong Nai
17	3	II27	Bac Ninh	49	5	V77	Ba Ria - Vung Tau
18	4	II22	Quang Ninh	50	6	V79	**Ho Chi Minh city**
19	5	II30	Hai Duong		**VI**	**Region 6. MEKONG RIVER DELTA**	
20	6	II31	**Hai Phong city**	51	1	VI80	Long An
21	7	II33	Hung Yen	52	2	VI82	Tien Giang
22	8	II34	Thai Binh	53	3	VI83	Ben Tre
23	9	II35	Ha Nam	54	4	VI84	Tra Vinh
24	10	II36	Nam Dinh	55	5	VI86	Vinh Long
25	11	II37	Ninh Binh	56	6	VI87	Dong Thap
	III	**Region 3. NORTH CENTRAL AND CENTRAL COASTAL AREAS**		57	7	VI89	An Giang
26	1	III38	Thanh Hoa	58	8	VI91	Kien Giang
27	2	III40	Nghe An	59	9	VI92	**Can Tho city**
28	3	III42	Ha Tinh	60	10	VI93	Hau Giang
29	4	III44	Quang Binh	61	11	VI94	Soc Trang
30	5	III45	Quang Tri	62	12	VI95	Bac Lieu
31	6	III46	Thua Thien Hue	63	13	VI96	Ca Mau

Source: Data obtained from GSO (2016m)

Table B.2 Retail Sales and GDP in Vietnam 1990-2015

Unit: Billion VND (at current prices)

Years	GDP	Retail Sales
1990	41955	19031
1991	76707	33404
1992	110532	51215
1993	140258	67273
1994	178534	93490
1995	228892	121160
1996	272036	145874
1997	313623	161900
1998	361017	185598
1999	399942	200924
2000	441646	220411
2001	481295	245315
2002	535762	280884
2003	613443	333809
2004	715307	398525
2005	914001	480294
2006	1061565	596207
2007	1246769	746159
2008	1616047	1007214
2009	1809149	1405865
2010	2157828	1677345
2011	2779880	2079524
2012	3245419	2369131
2013	3584262	2615204
2014	3937856	2916200
2015	4192862	3186600

Note: Correlation result of RS and GDP (calculated by Data Analysis Tools of Microsoft Excel) as follows:

	GDP	*Retail Sale*
GDP	1	
Retail Sale	0.99740877	1

Source: Data obtained from GSO (2016i) and GSO (2016r)

Table B.3 An Example of Computing Education Level (EDU) in Vietnam 2000-2015

Years	Average Population	The student number in universities and colleges	Education Level
	POP (in thousand persons)	**STU** (in students)	$EDU(\%) = \frac{STU}{POP \times 1000} \times 100$
2000	77630.9	452396	0.5828
2001	78620.5	873039	1.1104
2002	79537.7	908811	1.1426
2003	80467.4	1131030	1.4056
2004	81436.4	1319754	1.6206
2005	82392.1	1404673	1.7049
2006	83311.2	1666239	2.0000
2007	84218.5	1928436	2.2898
2008	85118.7	1675700	1.9687
2009	86025.0	1796174	2.0880
2010	86947.4	2162106	2.4867
2011	87860.4	2208062	2.5131
2012	88809.3	2208062	2.4863
2013	89759.5	2058922	2.2938
2014	90728.9	2363942	2.6055
2015	91713.3	2118500	2.3099

Note: Education level (EDU) is the rate of the student numbers in universities and colleges (STU) over the average population (POP). The table shows how to calculate EDU at the national level. The formula used to compute EDU (EDU = STU/POP/1000) is also employed at the regional and provincial levels. An EDU value of 2.3099 in 2015 means that 2.3099% of population enrolled in universities and colleges in Vietnam in 2015.

Source: EDU computed based on data is collected from GSO (2017a) and GSO (2017b)

Table B.4 The Quality of Official Websites of Provinces and Cities (WEB) in Vietnam (Evaluation Date: 20 June, 2011)

Provinces or cities	Factors					WEB	Websites
	i	ii	iii	iv	v		
Ha Giang	0	0	0	0	0	0	http://www.hagiang.gov.vn
Cao Bang	1	0	0	0	0	1	http://www.caobang.gov.vn
Bac Kan	0	0	0	0	0	0	http://www.backan.gov.vn
Tuyen Quang	1	0	1	0	0	2	http://www.tuyenquang.gov.vn
Lao Cai	0	0	0	0	0	0	http://www.laocai.gov.vn
Yen Bai	0	0	0	0	0	0	http://www.yenbai.gov.vn
Thai Nguyen	0	0	0	0	0	0	http://www.thainguyen.gov.vn
Lang Son	0	0	0	0	0	0	http://www.langson.gov.vn
Bac Giang	1	0	1	0	0	2	http://www.bacgiang.gov.vn
Phu Tho	1	0	1	1	0	3	http://www.phutho.gov.vn
Lai Chau	1	0	0	0	1	2	http://www.laichau.gov.vn
Son La	1	0	0	0	0	1	http://www.sonla.gov.vn
Hoa Binh	1	1	1	1	0	4	http://www.ipshoabinh.gov.vn/english
Ha Noi	1	0	0	0	0	1	http://www.hanoi.gov.vn
Vinh Phuc	1	0	1	1	0	3	http://www.vinhphuc.gov.vn
Bac Ninh	0	0	0	0	0	0	http://www.bacninh.gov.vn
Quang Ninh	1	0	1	1	0	3	http://www.quangninh.gov.vn
Hai Duong	0	0	0	0	0	0	http://www.haiduong.gov.vn
Hai Phong	1	0	1	1	0	3	http://www.haiphong.gov.vn
Hung Yen	1	0	0	0	0	1	http://www.hungyen.gov.vn
Thai Binh	1	0	0	0	0	1	http://www.thaibinh.gov.vn
Ha Nam	1	0	0	0	0	1	http://www.hanam.gov.vn
Nam Dinh	1	1	1	1	0	4	http://www.namdinhbusiness.gov.vn
Ninh Binh	0	0	0	0	0	0	http://www.ninhbinh.gov.vn
Thanh Hoa	0	0	0	0	0	0	http://www.thanhhoa.gov.vn
Nghe An	0	0	0	0	0	0	http://www.ngheanbusiness.gov.vn
Ha Tinh	1	1	0	1	0	3	http://dhtn.hatinh.gov.vn
Quang Binh	1	0	1	1	0	3	http://www.quangbinh.gov.vn
Quang Tri	0	0	0	0	0	0	http://www.quangtri.gov.vn
Thua Thien Hue	1	0	1	1	0	3	http://www.hue.gov.vn
Da Nang	1	1	1	1	0	4	http://www.danang.gov.vn
Quang Nam	0	0	0	0	0	0	http://www.quangnam.gov.vn
Quang Ngai	1	0	1	0	0	2	http://www.quangngai.gov.vn
Binh Dinh	1	1	1	1	0	4	http://www.binhdinhinvest.gov.vn
Phu Yen	0	0	0	0	0	0	http://www.phuyen.gov.vn
Khanh Hoa	0	0	0	0	0	0	http://www.khanhhoa.gov.vn
Ninh Thuan	1	0	1	1	0	3	http://www.ninhthuan.gov.vn
Binh Thuan	0	0	0	0	0	0	http://www.binhthuan.gov.vn
Kon Tum	0	0	0	0	0	0	http://www.kontum.gov.vn
Gia Lai	1	0	0	0	0	1	http://khdtgialai.gov.vn
Dak Lak	1	1	1	1	0	4	http://www.daklak.gov.vn
Lam Dong	0	0	0	0	0	0	http://www.lamdong.gov.vn

Provinces or cities	Factors					WEB	Websites
	i	ii	iii	iv	v		
Binh Phuoc	1	0	1	0	1	3	http://www.binhphuoc.gov.vn
Tay Ninh	1	1	1	1	0	4	http://www.tayninh.gov.vn
Binh Duong	0	0	0	0	0	0	http://www.binhduong.gov.vn
Dong Nai	1	1	1	1	1	5	http://www.dongnai.gov.vn
Ba Ria - Vung Tau	0	0	0	0	0	0	http://www.baria-vungtau.gov.vn
Ho Chi Minh city	1	1	1	1	0	4	http://www.hochiminhcity.gov.vn
Long An	1	0	1	1	0	3	http://www.longan.gov.vn
Tien Giang	0	0	0	0	0	0	http://www.tiengiang.gov.vn
Ben Tre	1	0	1	1	0	3	http://www.bentre.gov.vn
Tra Vinh	1	0	1	1	0	3	http://www.travinh.gov.vn
Vinh Long	0	0	0	0	0	0	http://www.vinhlong.gov.vn
Dong Thap	0	0	0	0	0	0	http://www.dongthap.gov.vn
An Giang	1	0	1	1	0	3	http://www.angiang.gov.vn
Kien Giang	1	1	0	1	0	3	http://www.kiengiang.gov.vn
Can Tho	1	1	1	1	0	4	http://www.cantho.gov.vn
Soc Trang	1	0	1	1	0	3	http://www.soctrang.gov.vn
Bac Lieu	0	0	0	0	0	0	http://www.baclieu.gov.vn
Ca Mau	0	0	0	0	0	0	http://www.camau.gov.vn

Note: WEB is evaluated by five factors: i) language availability includes more than one language; ii) availability of law documents; iii) economics and social information (on English page); iv) documents of investment registration (on English page); v) online registration and support (on English page). Each factor is evaluated based on the websites listed in the last column of the table by scoring 1 for a YES answer or 0 for a NO. WEB is the sum of the five factors' scores with the same value from 2000 to 2011.

Source: Information adapted from the website addresses listed in the *Websites* column.

Table B.5 The Quality of Official Websites of Provinces and Cities (WEB) in Vietnam (Evaluation Date: 6 September, 2016)

Provinces or cities	Factors					WEB	Websites	Start year
	i	ii	iii	iv	v			
Ha Giang	0	1	0	0	0	1	http://www.hagiang.gov.vn	2012
Cao Bang	0	1	0	0	0	1	http://www.caobang.gov.vn	2016
Bac Kan	0	1	0	0	0	1	http://www.backan.gov.vn	2012
Tuyen Quang	0	1	0	0	0	1	http://www.tuyenquang.gov.vn	2012
Lao Cai	1	1	0	0	0	2	http://www.laocai.gov.vn	2016
Yen Bai	0	1	0	0	0	1	http://www.yenbai.gov.vn	2016
Thai Nguyen	1	1	1	0	0	3	http://www.thainguyen.gov.vn	2012
Lang Son	0	1	0	0	0	1	http://www.langson.gov.vn	2015
Bac Giang	1	1	1	0	0	3	http://www.bacgiang.gov.vn	2012
Phu Tho	1	1	1	1	1	5	http://www.phutho.gov.vn	2014
Lai Chau	1	1	1	0	0	3	http://www.laichau.gov.vn	2014
Son La	1	1	0	0	0	2	http://www.sonla.gov.vn	2012
Hoa Binh	1	1	1	0	0	3	http://www.hoabinh.gov.vn	2012
Ha Noi	1	1	1	1	0	4	http://www.hanoi.gov.vn	2009
Vinh Phuc	1	1	1	1	0	4	http://www.vinhphuc.gov.vn	2012
Bac Ninh	1	1	1	1	0	4	http://www.bacninh.gov.vn	2011
Quang Ninh	1	1	1	1	0	4	http://www.quangninh.gov.vn	2015
Hai Duong	0	1	1	1	0	3	http://www.haiduong.gov.vn	2012
Hai Phong	1	1	1	1	0	4	http://haiphong.gov.vn	2012
Hung Yen	1	1	1	0	0	3	http://www.hungyen.gov.vn	2012
Thai Binh	1	1	1	1	0	4	http://www.thaibinh.gov.vn	2012
Ha Nam	1	1	1	0	0	3	http://hanam.gov.vn	2012
Nam Dinh	1	1	0	0	0	2	http://www.namdinh.gov.vn	2012
Ninh Binh	1	1	1	0	0	3	http://ninhbinh.gov.vn	2012
Thanh Hoa	1	1	0	0	0	2	http://www.thanhhoa.gov.vn	2012
Nghe An	1	1	1	1	0	4	http://www.nghean.gov.vn	2012
Ha Tinh	1	1	0	0	0	2	http://dhtn.hatinh.gov.vn	2012
Quang Binh	1	1	1	1	0	4	http://www.quangbinh.gov.vn	2015
Quang Tri	0	1	0	0	0	1	http://www.quangtri.gov.vn	2012
Thua Thien Hue	1	1	1	0	0	3	http://www.hue.gov.vn	2014
Da Nang	1	1	1	1	0	4	http://www.danang.gov.vn	2012
Quang Nam	1	1	1	0	0	3	http://www.quangnam.gov.vn	2015
Quang Ngai	1	1	1	0	0	3	http://www.quangngai.gov.vn	2012
Binh Dinh	1	1	1	1	0	4	http://www.binhdinh.gov.vn	2012
Phu Yen	0	1	0	0	0	1	http://www.phuyen.gov.vn	2005
Khanh Hoa	1	1	1	1	0	4	http://www.khanhhoa.gov.vn	2015
Ninh Thuan	1	1	1	1	0	4	http://www.ninhthuan.gov.vn	2005
Binh Thuan	0	1	0	0	0	1	http://www.binhthuan.gov.vn	2012
Kon Tum	0	1	0	0	0	1	http://www.kontum.gov.vn	2013
Gia Lai	0	0	0	0	0	0	http://gialai.gov.vn	Cannot access
Dak Lak	0	0	0	0	0	0	http://www.daklak.gov.vn	Cannot access
Lam Dong	1	1	1	1	0	4	http://www.lamdong.gov.vn	2012

Provinces or cities	Factors					WEB	Websites	Start year
	i	ii	iii	iv	v			
Binh Phuoc	1	1	1	0	0	3	http://www.binhphuoc.gov.vn	2006
Tay Ninh	0	0	1	0	0	1	http://www.tayninh.gov.vn	2010
Binh Duong	0	0	0	0	0	0	http://www.binhduong.gov.vn	Cannot access
Dong Nai	1	1	1	1	1	5	http://www.dongnai.gov.vn	2005
Ba Ria - Vung Tau	1	1	1	1	0	4	http://www.baria-vungtau.gov.vn	2012
Ho Chi Minh city	1	1	1	1	0	4	http://www.hochiminhcity.gov.vn	2006
Long An	1	0	1	1	0	3	http://www.longan.gov.vn	2012
Tien Giang	0	0	0	0	0	0	http://www.tiengiang.gov.vn	Cannot access
Ben Tre	0	1	0	0	0	1	http://www.bentre.gov.vn	2004
Tra Vinh	1	1	1	1	0	4	http://www.travinh.gov.vn	2007
Vinh Long	1	1	1	1	0	4	http://www.vinhlong.gov.vn	2007
Dong Thap	1	0	1	1	0	3	http://www.dongthap.gov.vn	2012
An Giang	1	0	1	1	0	3	http://www.angiang.gov.vn	2010
Kien Giang	1	0	1	1	0	3	http://www.kiengiang.gov.vn	2012
Can Tho	1	1	1	1	0	4	http://www.cantho.gov.vn	2012
Soc Trang	1	0	1	1	0	3	http://www.soctrang.gov.vn	2005
Bac Lieu	1	0	1	1	0	3	http://www.baclieu.gov.vn	2016
Ca Mau	1	0	1	1	0	3	http://www.camau.gov.vn	2008

Note: WEB was evaluated for the second time on 6th September, 2016 similar to the first evaluation on 20 June, 2011 (see Table B.3). If one of the websites could not be accessed, all the five factors are scored a value of 0. The column **Start year** indicates the first year when the website was used. If the start year is between 2012 and 2015, WEB takes the value of the first evaluation before the start year, and takes the value of the second evaluation from the start year. For example, in Quang Nam, WEB takes a value of 0 from 2000 to 2014 and 3 in 2015 because the start year of its website is 2015. Otherwise, results of the first and second evaluations are used for the period 2000-2011 and the period 2012-2015, respectively.

Source: Information adapted from the website addresses listed in the *Websites* column.

Table B.6 A List of Free Trade Agreements in which Vietnam is a Member

No.	Names	Date of signed and in effect
1	ASEAN Free Trade Area (AFTA)	01/01/1993
2	The US-Vietnam Bilateral Trade Agreement (BTA)	10/12/2001
3	ASEAN-People's Republic of China Comprehensive Economic Cooperation Agreement (ACFTA)	01/07/2005
4	ASEAN-Republic of Korea Comprehensive Economic Cooperation Agreement (AKFTA)	01/06/2007
5	ASEAN-Japan Comprehensive Economic Partnership (AJCEP)	01/12/2008
6	Japan-Vietnam Economic Partnership Agreement (Japan-Vietnam EPA)	01/10/2009
7	ASEAN-India Comprehensive Economic Cooperation Agreement (ASEAN-India CECA)	01/01/2010
8	ASEAN-Australia and New Zealand Free Trade Agreement (ASEAN-ANZ FTA)	01/01/2010
9	Chile-Vietnam Free Trade Agreement (Chile-Viet Nam FTA)	14/03/2012
10	Republic of Korea-Vietnam Free Trade Agreement (Republic of Korea-Vietnam FTA)	20/12/2015

Note: FTA variable is the number of Free Trade Agreements (signed and in effect) in which Vietnam is a member. The information from ARIC (2016) gives results as follows: FTA = 0 from 1990 to 1992, FTA = 1 from 1993 to 2000, FTA = 2 from 2001 to 2004, FTA = 3 from 2005 to 2006, FTA = 4 in 2007, FTA = 5 in 2008, FTA = 6 in 2009, FTA = 8 from 2010 to 2011, FTA = 9 from 2012 to 2014 and FTA = 10 in 2015.

Source: Information is gathered from ARIC (2016)

Table B.7 The Methods for Constructing the Province Ranking (PR) Variable

No.	Cities or Provinces	Decree No. 24/2000/ ND-CP	Decree No. 108/2006/ ND-CP	No.	Cities or Provinces	Decree No. 24/2000/ ND-CP	Decree No. 108/2006/ ND-CP
I	**Region 1. Northern Midlands and Mountain Areas**			31	**Da Nang city**	1	2
1	Ha Giang	2	2	32	Quang Nam	2	2
2	Cao Bang	2	2	33	Quang Ngai	2	2
3	Bac Kan	2	2	34	Binh Dinh	2	2
4	Tuyen Quang	2	2	35	Phu Yen	2	2
5	Lao Cai	2	2	36	Khanh Hoa	2	2
6	Yen Bai	2	2	37	Ninh Thuan	2	2
7	Thai Nguyen	2	2	38	Binh Thuan	2	2
8	Lang Son	2	2	**IV**	**Region 4. Central Highlands**		
9	Bac Giang	2	2	39	Kon Tum	2	2
10	Phu Tho	2	2	40	Gia Lai	2	2
11	**Lai Chau**	2	2	41	Dak Lak	2	2
12	Son La	2	2	42	Lam Dong	2	2
13	Hoa Binh	2	2	**V**	**Region 5. South East**		
II	**Region 2. Red River Delta**			43	Binh Phuoc	2	2
14	**Ha Noi city**	1	0	44	Tay Ninh	1	2
15	Vinh Phuc	2	0	45	Binh Duong	1	0
16	Bac Ninh	1	0	46	Dong Nai	2	0
17	Quang Ninh	2	2	47	Ba Ria - Vung Tau	1	2
18	Hai Duong	2	0	48	**Ho Chi Minh city**	1	0
19	**Hai Phong city**	1	2	**VI**	**Region 6. Mekong River Delta**		
20	Hung Yen	1	0	49	Long An	2	1
21	Thai Binh	1	1	50	Tien Giang	2	2
22	Ha Nam	1	1	51	Ben Tre	2	2
23	Nam Dinh	1	1	52	Tra Vinh	2	2
24	Ninh Binh	2	1	53	Vinh Long	2	1
III	**Region 3. North Central and Central Coastal Areas**			54	Dong Thap	2	2
25	Thanh Hoa	2	2	55	An Giang	2	2
26	Nghe An	2	2	56	Kien Giang	2	2
27	Ha Tinh	2	2	57	**Can Tho city**	2	0
28	Quang Binh	2	2	58	Soc Trang	2	2
29	Quang Tri	2	2	59	Bac Lieu	2	2
30	Thua Thien Hue	2	2	60	Ca Mau	2	2

Note: PR=2 if provinces and cities are on the list of areas under the extreme difficult socio-economic condition, PR = 1 if provinces or cities are on the list of areas under the difficult socio-economic condition, and PR = 0 otherwise. PR values under Decree No. 24/2000/ND-CP and Decree No. 108/2006/ND-CP are applied in the period 2000-2005 and the period 2006-2015, respectively.
Source: Information is gathered from Appendix I (List of areas where investment is encouraged) of Decree No. 24/2000/ND-CP (Government, 2000) and Appendix III (List of areas where investment is encouraged) of Decree No. 108/2006/ND-CP (Government, 2006).

Table B.8 Methods for Constructing Country Risk

Sub-index	Voice and Accountability (VA)	Political Stability and Absence of Violence (PV)	Government Effectiveness (GE)	Regulatory Quality (RQ)	Rule of Law (RL)	Control of Corruption (CC)	Country Risk - CR
Weight	**12%**	**42%**	**4%**	**12%**	**6%**	**6%**	
1996	0.42	0.93	0.50	0.55	0.83	0.50	0.74
1997	0.42	0.93	0.50	0.55	0.83	0.50	0.74
1998	0.17	0.87	0.50	0.36	0.83	0.33	0.63
1999	0.17	0.87	0.50	0.36	0.83	0.33	0.63
2000	0.25	0.91	0.50	0.55	0.83	0.33	0.69
2001	0.25	0.91	0.50	0.55	0.83	0.33	0.69
2002	0.25	0.88	0.50	0.59	0.67	0.25	0.66
2003	0.25	0.88	0.50	0.55	0.67	0.25	0.66
2004	0.33	0.86	0.50	0.68	0.67	0.25	0.68
2005	0.33	0.86	0.50	0.68	0.67	0.25	0.68
2006	0.33	0.86	0.50	0.73	0.67	0.42	0.70
2007	0.33	0.86	0.50	0.73	0.67	0.58	0.71
2008	0.33	0.85	0.50	0.64	0.67	0.58	0.69
2009	0.33	0.85	0.50	0.64	0.67	0.58	0.69
2010	0.38	0.84	0.50	0.64	0.67	0.42	0.68
2011	0.38	0.79	0.50	0.55	0.67	0.42	0.64
2012	0.38	0.78	0.50	0.55	0.67	0.42	0.64
2013	0.38	0.76	0.50	0.55	0.67	0.42	0.63
2014	0.38	0.78	0.50	0.64	0.67	0.42	0.65
2015	0.38	0.79	0.50	0.64	0.67	0.42	0.66

Note: VA, PV, GE, RQ, RL, and CC are available every two years from 1996 to 2001, therefore their values in 1997, 1999 and 2001 are equal to those in 1996, 1998 and 2000, respectively. CR and the sub-indices are the same at the national, regional and provincial levels. CR is computed as:

$$CR = \frac{\sum(Point_s \times Weight_s)}{\sum(Weight_s)}$$

For example:

$$CR_{2015} = \frac{0.38 \times 0.12 + 0.79 \times 0.42 + 0.50 \times 0.04 + 0.64 \times 0.12 + 0.67 \times 0.06 + 0.42 \times 0.06}{0.12 + 0.42 + 0.04 + 0.12 + 0.06 + 0.06} = 0.66$$

Source: CR is computed by based on data of VA, PV, GE, RQ, RL, and CC from PRS (2017).

Table B.9 A Summary of Variables in this Study at Vietnam's Provincial, Regional and National Levels

Variable groups	No.	Variable name	Notations			Units
			Provinces	Regions	Vietnam	
FDI	1	FDI Registered Capital	FDI_{it}	FDI_{jt}	FDI_t	Million USD
Economic growth	2	GDP			GDP_t	Billion VND
	3	Retail Sales	RS_{it}	RS_{jt}	RS_t	Billion VND
Demographic and human capital	4	Average Population	POP_{it}	POP_{jt}	POP_t	Thousand persons
	5	Labour Force	LF_{it}	LF_{jt}	LF_t	Thousand persons
	6	Education Level	EDU_{it}	EDU_{jt}	EDU_t	%
Economic	7	Open Trade			OT_t	Billion VND
	8	Exchange Rate	ER_{it}	ER_{jt}	ER_t	VND/USD
	9	Inflation	CPI_{it}	CPI_{jt}	CPI_t	
	10	Incremental Capital Output Ratio	$ICOR_{it}$	$ICOR_{jt}$	$ICOR_t$	
	11	Monthly Average Income	INC_{it}	INC_{jt}	INC_t	Thousand VND
	12	State-Owned Investment			$STATE_t$	%
	13	Non-State-Owned Investment (Marketization)			MKT_t	%
	14	Science, Technology and Environment Expenditure			SCI_t	%
	15	Financial Crisis 2008	CRI_{it}	CRI_{jt}	CRI_t	
Infrastructure	16	Volume of Goods Freight	FRE_{it}	FRE_{jt}	FRE_t	Thousand tons
	17	Number of Patient Beds	BED_{it}	BED_{jt}	BED_t	Thousand beds
	18	The Development of Communication			COM_t	Thousand subscribers
	19	Website quality	WEB_{it}			
Policy and law related	20	Law of Investment and Enterprise	LAW_{it}	LAW_{jt}	LAW_t	
	21	World Trade Organization	WTO_{it}	WTO_{jt}	WTO_t	
	22	Free Trade Agreements	FTA_{it}	FTA_{jt}	FTA_t	
	23	Province Ranking	PR_{it}			
	24	Province Ranking (Dummy)	$PR2_{it}$			
	25	Region Ranking		RR_{jt}		
	26	Region Ranking (Dummy)		$RR2_{jt}$		
Provincial competition and institutional factors	27	Investment Incentive Policies	IIP_{it}			
	28	Provincial Competitiveness Index	PCI_{it}			
	29	Entry Costs	$ENTRY_{it}$			
	30	Land Access and Security of Tenure	$LAND_{it}$			
	31	Transparency and Access to Information	$ACCESS_{it}$			
	32	Time Costs and Regulatory Compliance	$TIME_{it}$			
	33	Informal Charges	$CHARGE_{it}$			
	34	Proactivity	$PROACT_{it}$			
	35	Business Support	$SUPPORT_{it}$			
	36	Labour & Training	$LABOUR_{it}$			
	37	Legal Institutions	$LEGAL_{it}$			
	38	Country Risk	CR_{it}	CR_{jt}	CR_t	

Note: i stands for Vietnam's provinces or cities, ***j*** stands for Vietnam's regions and ***t*** stands for years.

Table B.10 The Studied Periods of Variables in this Study at Vietnam's Provincial, Regional and National Levels

Variable groups	No.	Variables	Studied period		
			Provinces	Regions	Vietnam
FDI	1	**FDI**	2000-2015	2000-2015	1990-2015
Economic growth	2	**GDP**			1990-2015
	3	**RS**	2000-2015	2000-2015	
Demographic and human capital	4	**POP**	2000-2015	2000-2015	1990-2015
	5	**LF**	2005-2015	2005-2015	2000-2015
	6	**EDU**	2000-2015	2000-2015	1999-2015
Economic	7	**OT**			1990-2015
	8	**ER**	2000-2015	2000-2015	1990-2015
	9	**CPI**	2000-2015	2000-2015	1995-2015
	10	**ICOR**	2000-2015	2000-2015	1995-2015
	11	**INC**	2000-2015	2000-2015	1995-2015
	12	**STATE**			1995-2015
	13	**MKT**			1995-2015
	14	**SCI**			2000-2014
	15	**CRI**	2000-2015	2000-2015	2000-2015
Infrastructure	16	**FRE**	2000-2015	2000-2015	2000-2014
	17	**COM**			1995-2015
	18	**WEB**	2000-2015		
Policy and law related	19	**LAW**	2000-2015	2000-2015	1990-2015
	20	**WTO**	2000-2015	2000-2015	1990-2015
	21	**FTA**	2000-2015	2000-2015	1990-2015
	22	**PR**	2000-2015		
	23	**PR2**	2000-2015		
	24	**RR**		2000-2015	
	25	**RR2**		2000-2015	
Provincial competition and institutional factors	26	**IIP**	2000-2015		
	27	**PCI**	2005-2015		
	28	**ENTRY**	2005-2015		
	29	**LAND**	2005-2015		
	30	**ACCESS**	2005-2015		
	31	**TIME**	2005-2015		
	32	**CHARGE**	2005-2015		
	33	**PROACT**	2005-2015		
	34	**SUPPORT**	2005-2015		
	35	**LABOUR**	2005-2015		
	36	**LEGAL**	2005-2015		
	37	**CR**	2000-2015	2000-2015	1996-2015
Medical	38	**BED**	2002-2015	2002-2015	2002-2015

Table B.11 Data Definitions and Sources

Variable groups	No.	Variable name	Abbreviation	Units	Definitions	Sources	Notes
FDI	1	FDI Registered Capital	**FDI**	Million USD	The total registered capital of licensed inward FDI projects annually (including added capital of projected licensed in previous years)	GSO (2016f), GSO (2016h), GSO (2015b)	(4)
Economic growth	2	GDP	**GDP**	Billion VND	Gross Domestic Product at current prices	GSO (2016i)	(1)
	3	Retail Sales	**RS**	Billion VND	Retail Sales of Goods and Services at current prices	GSO (2016q), GSO (2016r)	(4)
Demographic and human capital	4	Average Population	**POP**	Thousand persons	Average Population	GSO (2017a), GSO (2016e)	(4)
	5	Labour Force	**LF**	Thousand persons	Labour Force at 15 years of age and above	GSO (2016k), GSO (2016l)	(4)
	6	Education Level	**EDU**	%	The rate of the student number in universities and colleges over the average population (see Appendix Table B.3).	The author	(4)
Economic	7	Open Trade	**OT**	Billion VND	Open Trade is a sum of Export and Import values of goods in Vietnam	The author, GSO (2016g)	(1)
	8	Exchange Rate	**ER**	VND/USD	VND USD yearly average exchange rate	FXTOP (2017)	(5)
	9	Inflation	**CPI**		Annual average Consumer Price Index representing the inflation in Vietnam	GSO (2016a)	(5)
	10	Incremental Capital Output Ratio	**ICOR**		Incremental Capital Output Ratio is the aggregated indicator of the ratio of investment to growth, which is equal to 1 divided by the marginal product of capital (see Appendix Table A.5).	The author, GSO (2016i), GSO (2016j)	(5)
	11	Monthly Average Income	**INC**	Thousand VND	The monthly average income per employee in state sector at current price	GSO (2016c), GSO (2016d), GSO (2004), GSO (2000a)	(4)
	12	State-Owned Investment	**STATE**	%	The share of the state-owned investment over the total investment	GSO (2016j)	(1)
	13	Marketization	**MKT**	%	The share of the non-state-owned investment over the total investment namely Marketization	GSO (2016j)	(1)
	14	Science, Technology and Environment Expenditure	**SCI**	%	The share of state budget expenditure on Science, Technology and Environment	GSO (2016s), GSO (2008), GSO (2005b)	(1)

Variable groups	No.	Variable name	Abbreviation	Units	Definitions	Sources	Notes
	15	Financial Crisis 2008	**CRI**		CRI is a dummy variable that reflects the financial crisis in 2008 (CRI=1 after 2007, CRI=0 otherwise)	The author	(5)
Infrastructure	16	Volume of Goods Freight	**FRE**	Thousand tons	Volume of goods freight	GSO (2016t) and GSO (2016u)	(4)
	17	The development of communication	**COM**	Thousand subscribers	The number of telephone and internet subscribers	GSO (2016p), GSO (2005a) and GSO (2000b)	(1)
	28	Website quality	**WEB**		The ability to access information of the investors (a category variable) is constructed based on the quality of official websites or portals of state bodies (provinces and cities) in Vietnam from 2000 to 2015. WEB is evaluated by five factors including i) languages' availability are more than one language; ii) availability of law documents; iii) Economics and Social Information (on English page); iv) documents of investment registration (on English page); v) Online registration and support (on English page). If all the five factors are available, WEB=5; four factors are available, WEB=4; three factors are available, WEB=3; two factors are available, WEB=2; one factor is available, WEB=1; otherwise WEB=0 (see Tables B.4 and B.5 in Appendix B).	The author	(2)
Policy and law related	19	Law of Investment and Enterprise	**LAW**		LAW is a dummy variable indicating Vietnam had new laws of Investment and Enterprise in 2005 (LAW = 0 in the period 2000-2004, LAW = 1 in the period 2005-2015).	The author	(5)
	20	World Trade Organization	**WTO**		WTO is a dummy variable indicating Vietnam joined WTO in 2007 (WTO = 0 in the period 2000-2007, WTO = 1 in the period 2008-2015).	The author	(5)
	21	Free Trade Agreements	**FTA**		The number of Free Trade Agreements in which Vietnam is a member (signed and in effect). FTA is constructed by the researcher based on data from ARIC (2016) (see Appendix Table B.6).	The author and ARIC (2016)	(5)
	22	Province Ranking	**PR**		Province Ranking indicates differences of investment condition among provinces and cities in Vietnam. PR is a category variable constructed as follows: PR=2 if provinces and cities are on the list of areas under the extreme difficult socio-economic condition, PR = 1 if provinces or cities are on the list of areas under the difficult socio-economic condition, and PR = 0 otherwise (see Appendix Table B.7).	The author	(2)

Variable groups	No.	Variable name	Abbreviation	Units	Definitions	Sources	Notes
	23	Province Ranking (Dummy)	**PR2**		PR2 is a dummy variable created based on PR as follows: PR2 = 1 if PR = 2, otherwise 0.	The author	(2)
	24	Region Ranking	**RR**		Region Ranking indicates differences of investment condition among regions. RR is a category variable defined based on PR as follows: RR = 0 if a region is not under extreme difficult and difficult socio-economic conditions, which means that the region owns at least one province under the neither extreme difficult nor difficult socio-economic condition (PR = 0); RR = 2 if a region is under extreme difficult socio-economic conditions, which means that all provinces belong to the region are under the extreme difficult socio-economic condition (PR = 2); RR = 1 otherwise.	The author	(3)
	25	Region Ranking (Dummy)	**RR2**		RR2 is a dummy variable created based on RR as follows: RR2 = 1 if the socio-economic condition of a region is extreme difficult (RR = 2), 0 otherwise (if the socio-economic condition of a region is not extreme difficult (either RR=1 or RR=0)).	The author	(3)
Provincial competition and institutional factors	26	Investment Incentive Policies	**IIP**		Investment Incentive Policies indicate competition in attracting FDI at the provincial level. IIP, a combination of three categories of free land, income tax and import tax exemption, is constructed based on regulations and laws in Vietnam from 2000 to 2015 at the provincial level (see Tables 4.2-4.5 in Chapter 4).	The author, Government (2000), Government (2005a), Government (2010b), Government (2014), Assembly (2003), Government (2003), Assembly (2008a), Assembly (2013), Government (2005b) and Government (2010a)	(2)
	27	Provincial Competitiveness Index	**PCI**		Provincial Competitiveness Index represents Vietnam's business environment and is assessed by an annual business survey of economic governance quality in encouraging development of the non-state sector in provinces and cities. PCI is available since 2005.	VCCI (2016a)	(2)

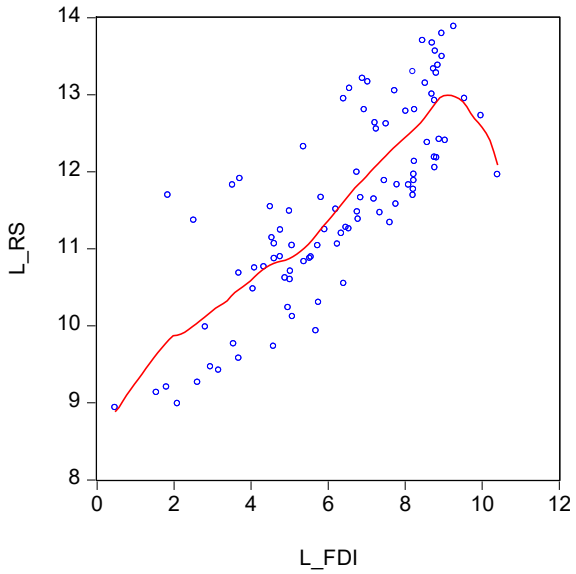
Variable groups	No.	Variable name	Abbreviation	Units	Definitions	Sources	Notes
	28	Entry Costs	**ENTRY**		ENTRY is one of ten PCI sub-indices. It shows the differences in entry costs for business start-up in provinces and cities in Vietnam.	VCCI (2016a)	(2)
	29	Land Access and Security of Tenure	**LAND**		LAND is one of ten PCI sub-indices. It shows how easy to access land and the security of tenure once land is acquired in provinces and cities in Vietnam.	VCCI (2016a)	(2)
	30	Transparency and Access to Information	**ACCESS**		ACCESS is one of ten PCI sub-indices. It shows firms' ability of accessing to the proper planning and legal documents necessary to run their businesses, equitable availability of those documents, predictable implementation of new policies and laws, and the business utility of the provincial webpage.	VCCI (2016a)	(2)
	31	Time Costs and Regulatory Compliance	**TIME**		TIME is one of ten PCI sub-indices. It shows how much time firms waste on bureaucratic compliance, as well as how often and for how long firms must shut their operations down for inspections by local regulatory agencies.	VCCI (2016a)	(2)
	32	Informal Charges	**CHARGE**		CHARGE is one of ten PCI sub-indices. It shows how much firms pay informal charges, how much of an obstacle those extra fees pose for their business operations, whether payment of those extra fees results in expected results or "services", and whether provincial officials use compliance with local regulations to extract rents.	VCCI (2016a)	(2)
	33	Proactivity	**PROACT**		PROACT is one of ten PCI sub-indices. It shows how much crowding out of private activity from policy biases toward state, foreign, or connected firms.	VCCI (2016a)	(2)
	34	Business Support	**SUPPORT**		SUPPORT is one of ten PCI sub-indices. It indicates provincial services for private sector trade promotion, provision of regulatory information to firms, business partner matchmaking, provision of industrial zones or industrial clusters, and technological services for firms.	VCCI (2016a)	(2)
	35	Labour & Training	**LABOUR**		LABOUR is one of ten PCI sub-indices. It shows the efforts by provincial authorities to promote vocational training and skills development for local industries and to assist in the placement of local labour.	VCCI (2016a)	(2)
	36	Legal Institutions	**LEGAL**		LEGAL is one of ten PCI sub-indices. It shows the private sector's confidence in provincial legal institutions; whether firms regard provincial legal institutions as an effective vehicle for dispute	VCCI (2016a)	(2)

Variable groups	No.	Variable name	Abbreviation	Units	Definitions	Sources	Notes
					resolution, or as an avenue for lodging appeals against corrupt official behaviour.		
	37	Country Risk	**CR**		Country Risk shows effects of institutional factors on FDI location in Vietnam and is computed based on ten out of 12 components of the political risk index (PRS, 2017). The ten components are divided into six sub-indexes including Voice and Accountability, Political Stability and Absence of Violence, Government Effectiveness, Regulatory Quality, Rule of Law, and Control of Corruption. CR rating of 0% to less than 50% indicates a Very High Risk; 50% to less than 60% High Risk; 60% to less than 70% Moderate Risk; 70% to less than 80% Low Risk; and 80.0% or more Very Low Risk (additional information on constructing CR is provided in Appendix Table B.8).	The author and PRS (2017)	(5)
Medical	38	Number of patient beds	**BED**	Thousand beds	The number of patient beds including those of hospitals, regional polyclinics, sanatorium and rehabilitation hospitals, and medical service units.	GSO (2016n) and GSO (2016o)	(4)

Note: (1) Variables are only available at the national level.
(2) Variables are only available at the provincial level.
(3) Variables are only available at the regrional level.
(4) Variables are available at the provincial, regional and national levels.
(5) Variables are only available at the national level. Therefore, data of these variables at the regional and provincial levels are assumed to have values of those at the national level. For example, according to Table B.8, in 2015, $CR_{VN} = 0.66$ infers that $CR_j = CR_i = CR_{VN} = 0.66$.

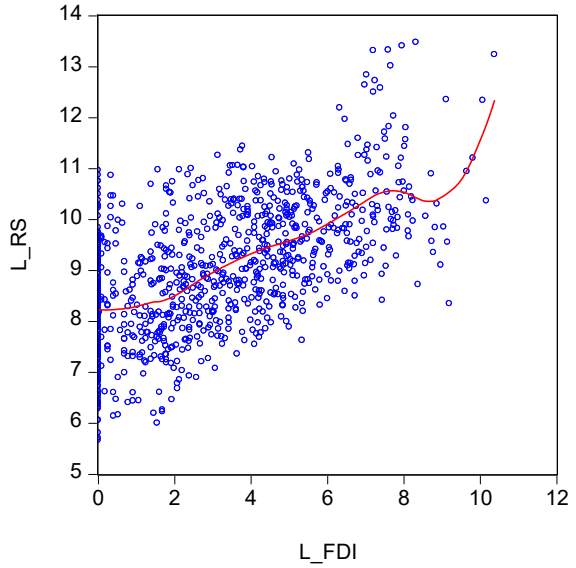
Appendix C

Data Descriptive Statistics



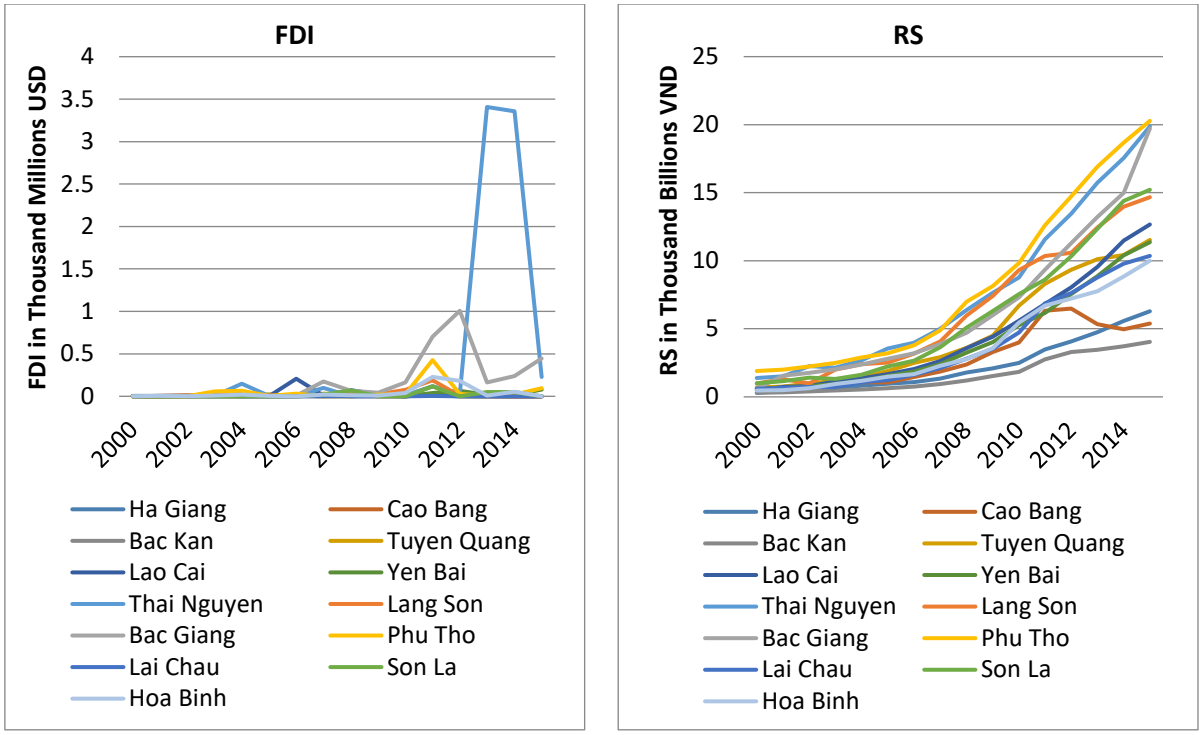
Note: The scatterplot is drawn with a panel option of stack cross sections and the Kernel Fit line.
Source: Author's calculations

Figure C.1 The Scatterplot of FDI and RS at the Regional Level in Vietnam



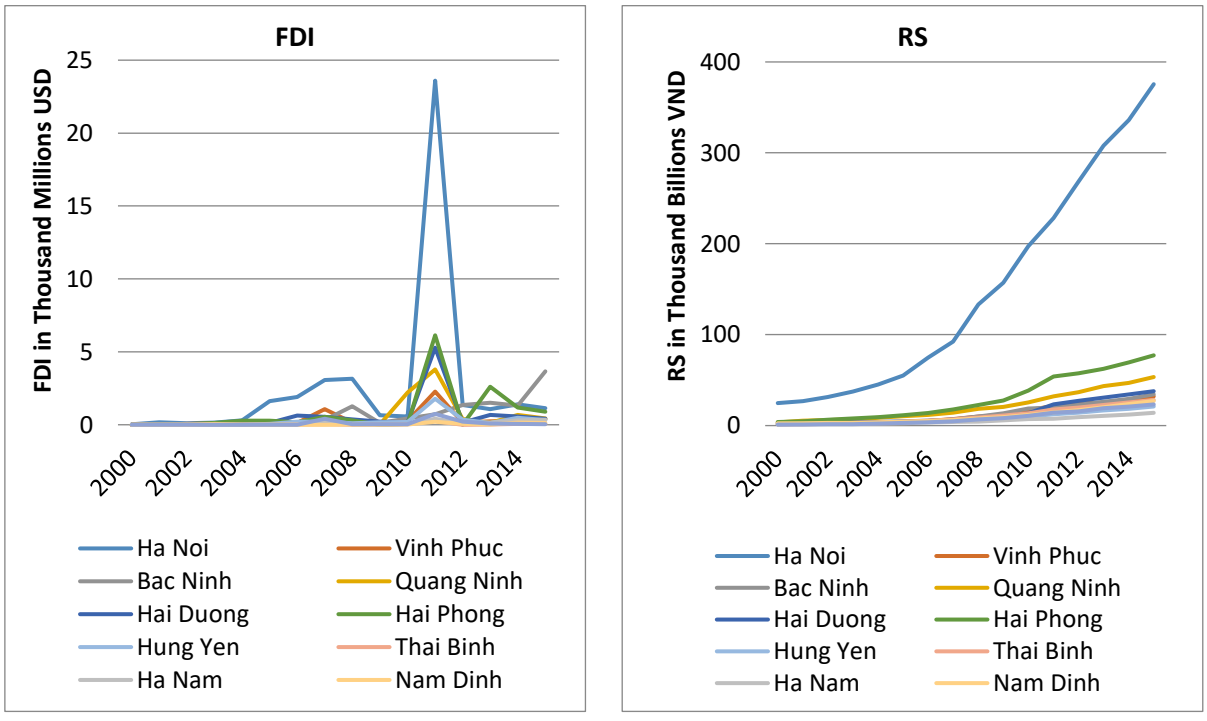
Note: The scatterplot is drawn with a panel option of stack cross sections and the Kernel Fit line.
Source: Author's calculations

Figure C.2 The Scatterplot of FDI and RS at the Provincial Level in Vietnam



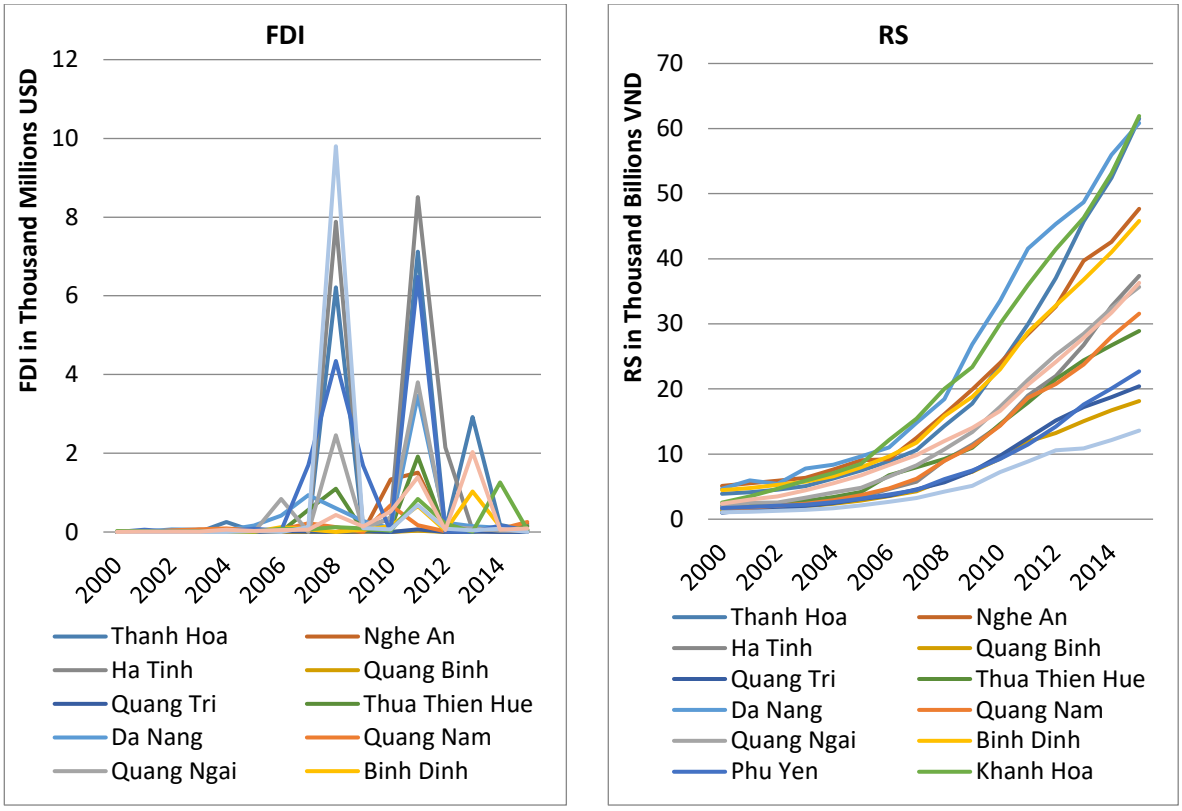
Source: Author's calculations

Figure C.3 FDI and RS in Region 1 – Northern Midlands and Mountain Areas (2000-2015)



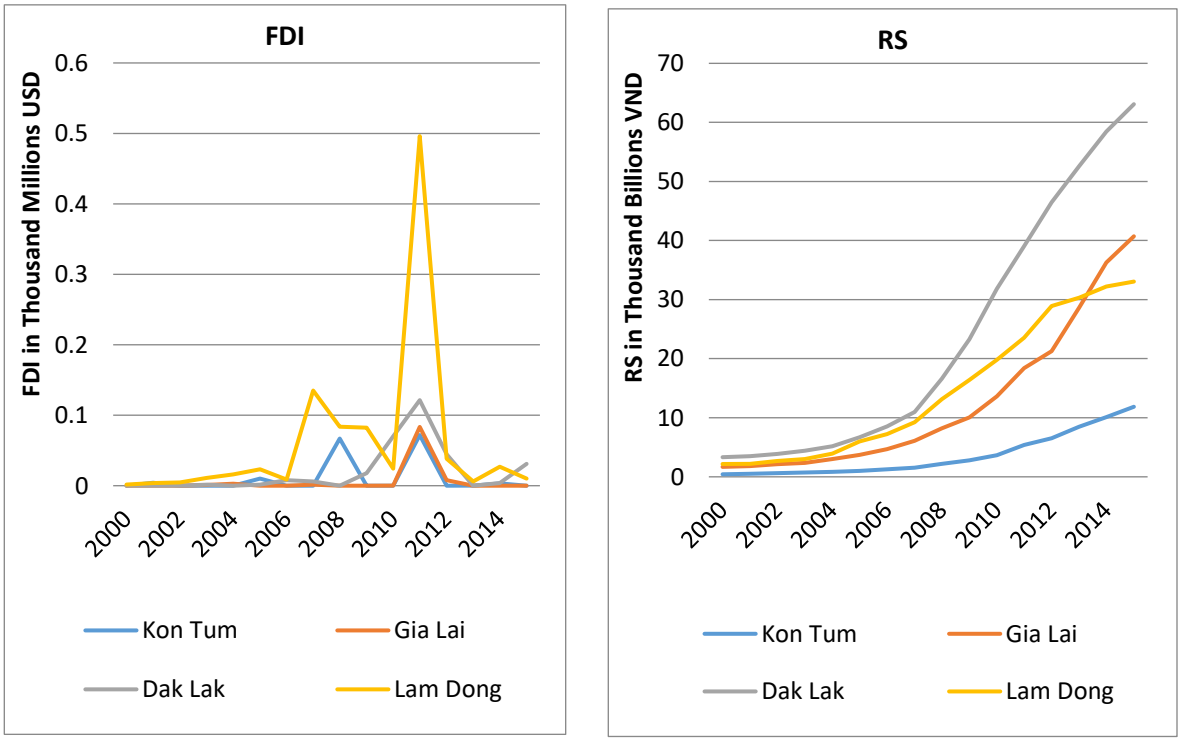
Source: Author's calculations

Figure C.4 FDI and RS in Region 2 – Red River Delta (2000-2015)



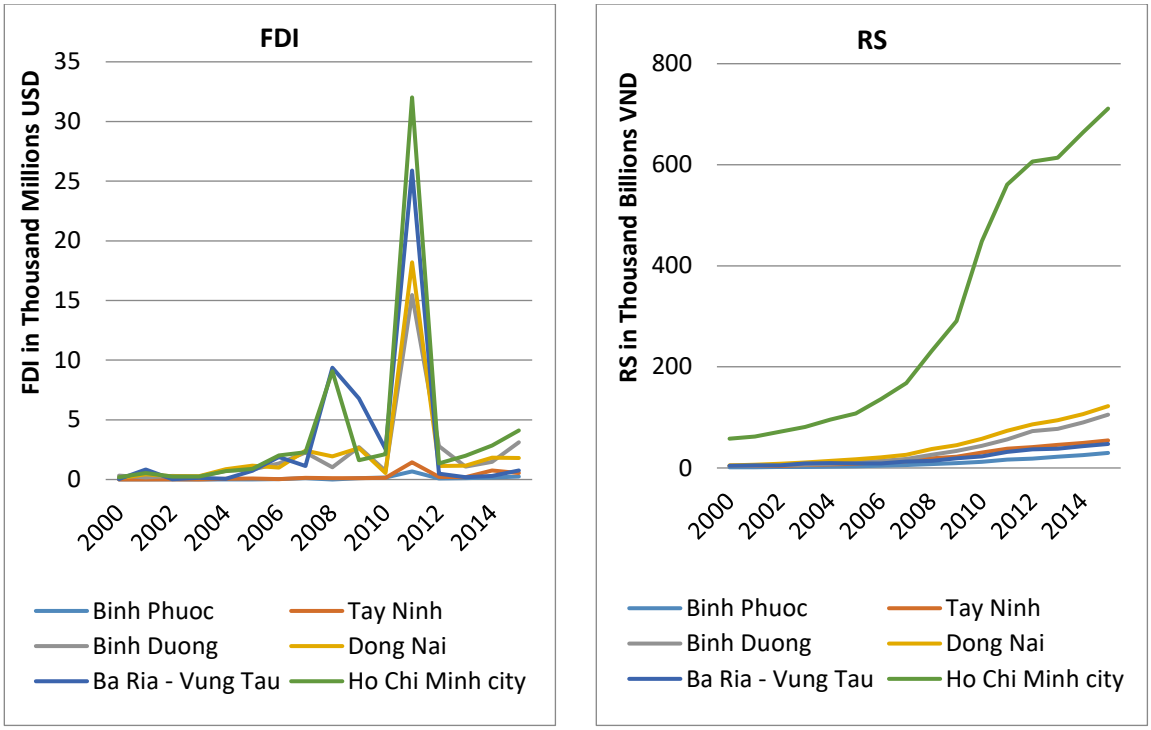
Source: Author's calculations

Figure C.5 FDI and RS in Region 3 – North Central and Central Coastal Areas (2000-2015)



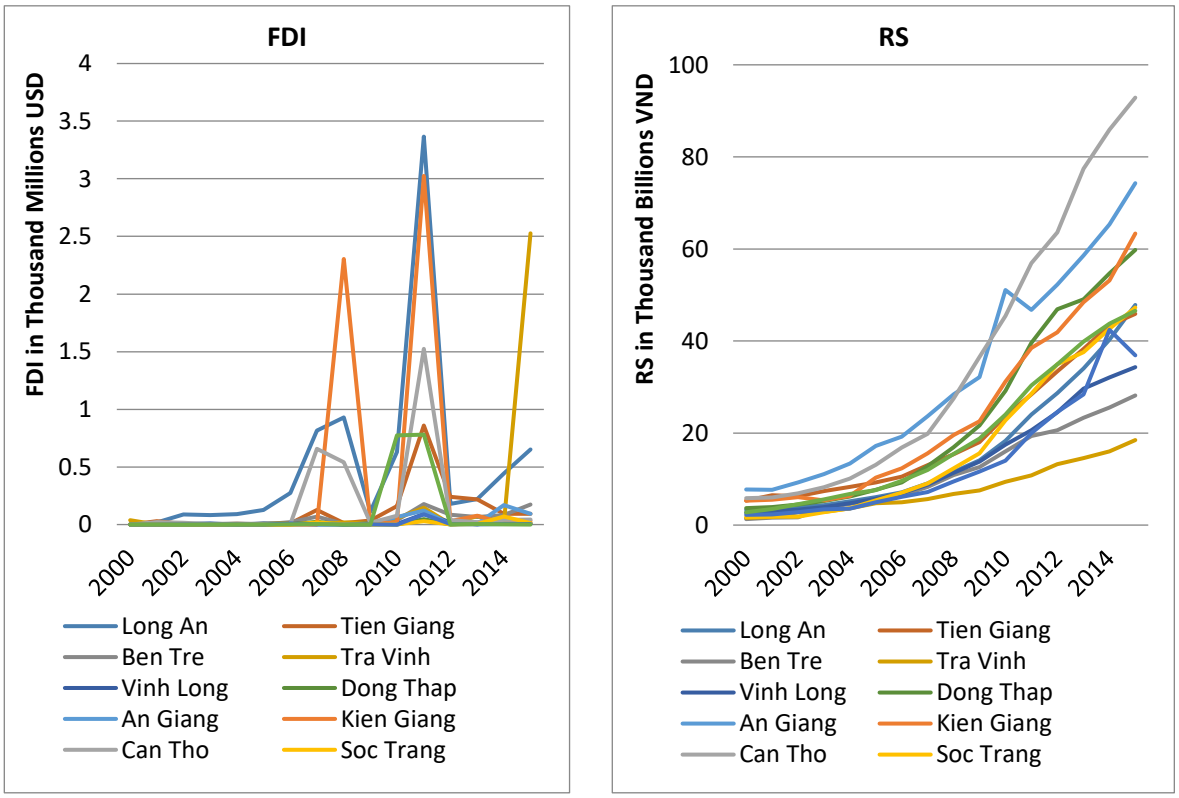
Source: Author's calculations

Figure C.6 FDI and RS in Region 4 – Central Highlands (2000-2015)



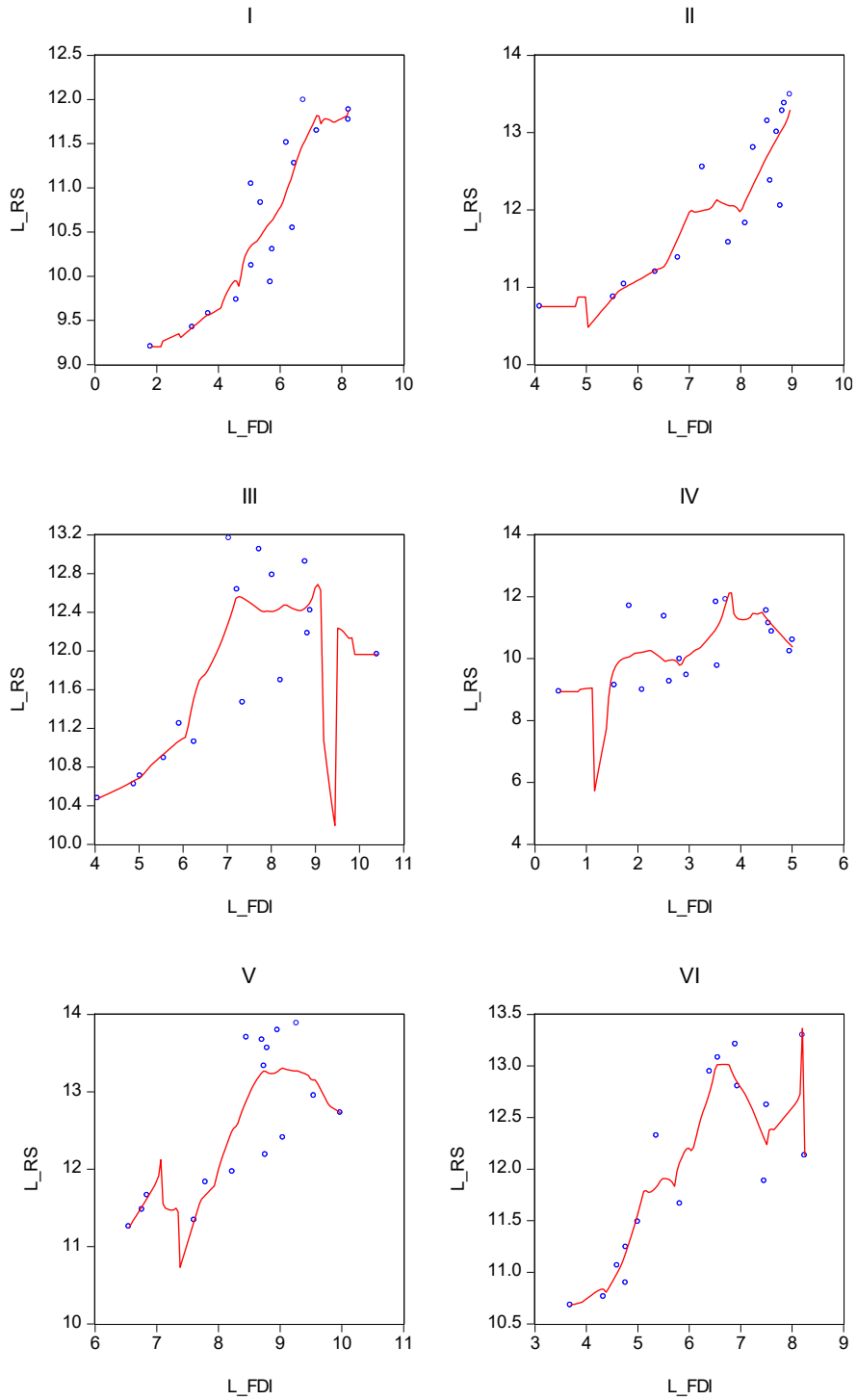
Source: Author's calculations

Figure C.7 FDI and RS in Region 5 – South East (2000-2015)



Source: Author's calculations

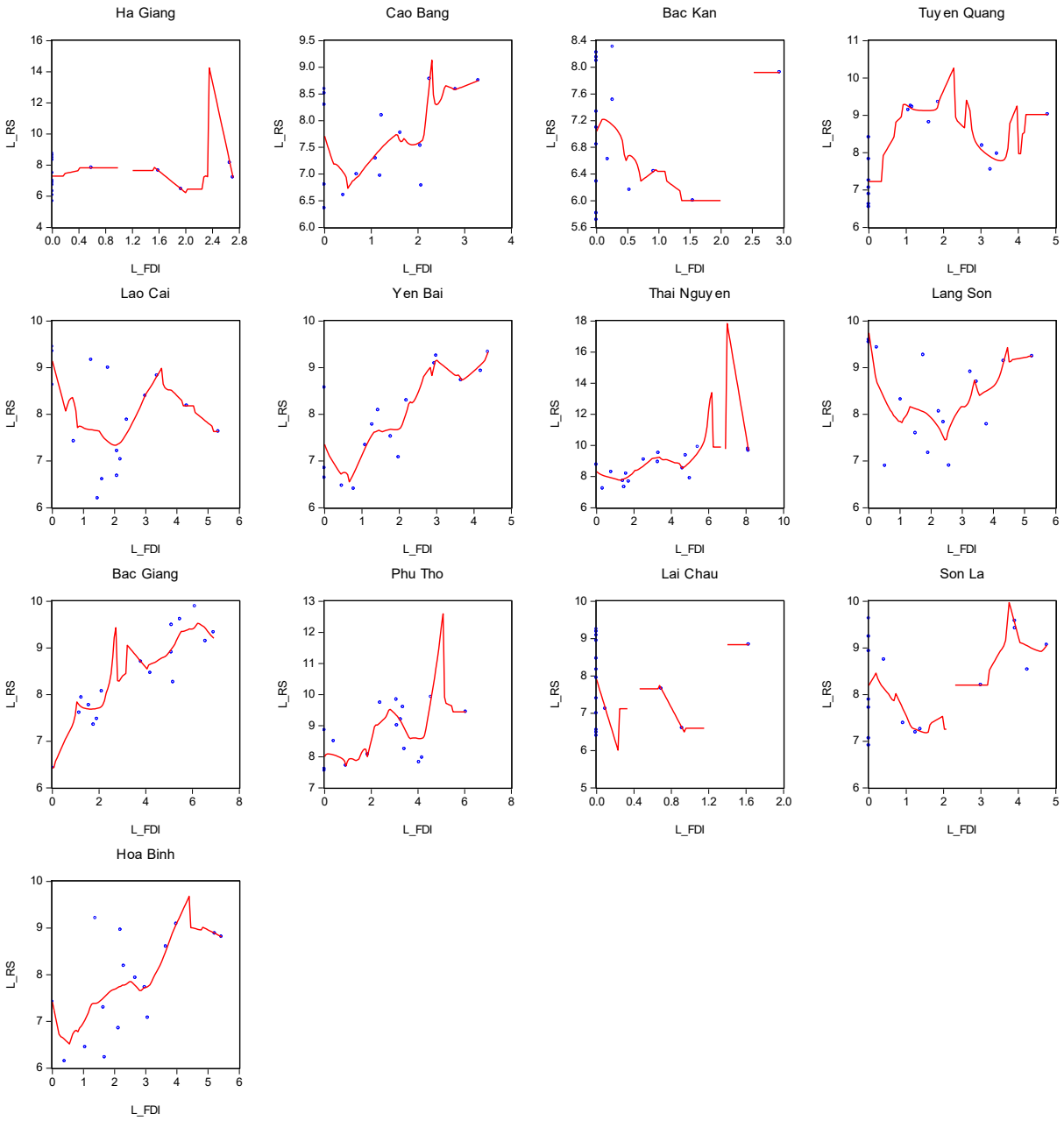
Figure C.8 FDI and RS in Region 6 – Mekong River Delta (2000-2015)



Note: I = Region 1 (The Northern Midlands and Mountain Areas);
II = Region 2 (The Red River Delta);
III = Region 3 (The North Central and Central Coastal Areas);
IV = Region 4 (The Central Highlands);
V = Region 5 (The South East); and
VI = Region 6 (The Mekong River Delta).
L_RS and L_FDI indicate that RS and FDI are natural logarithm values.

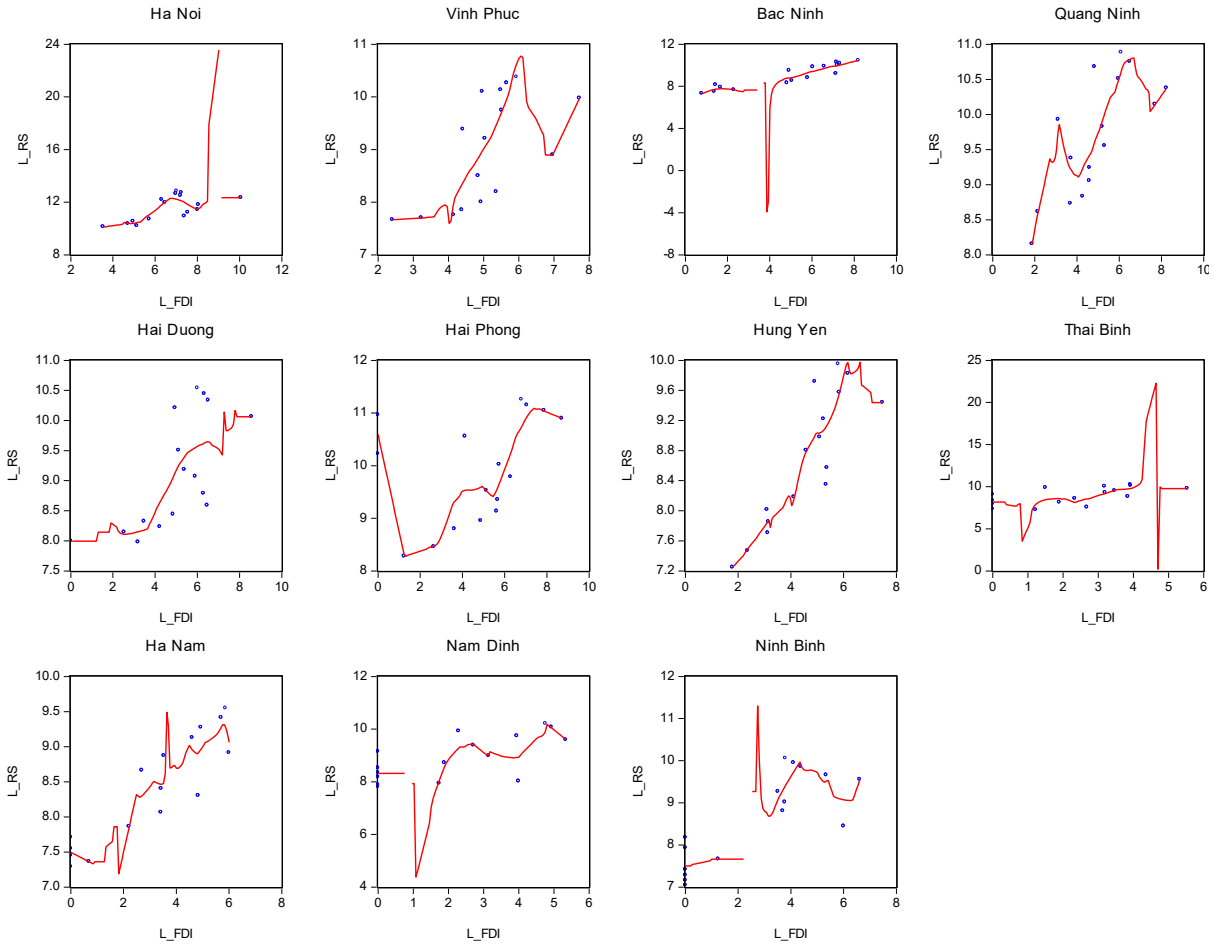
Source: Author's calculations

Figure C.9 Scatterplots of FDI and RS in Six Regions of Vietnam



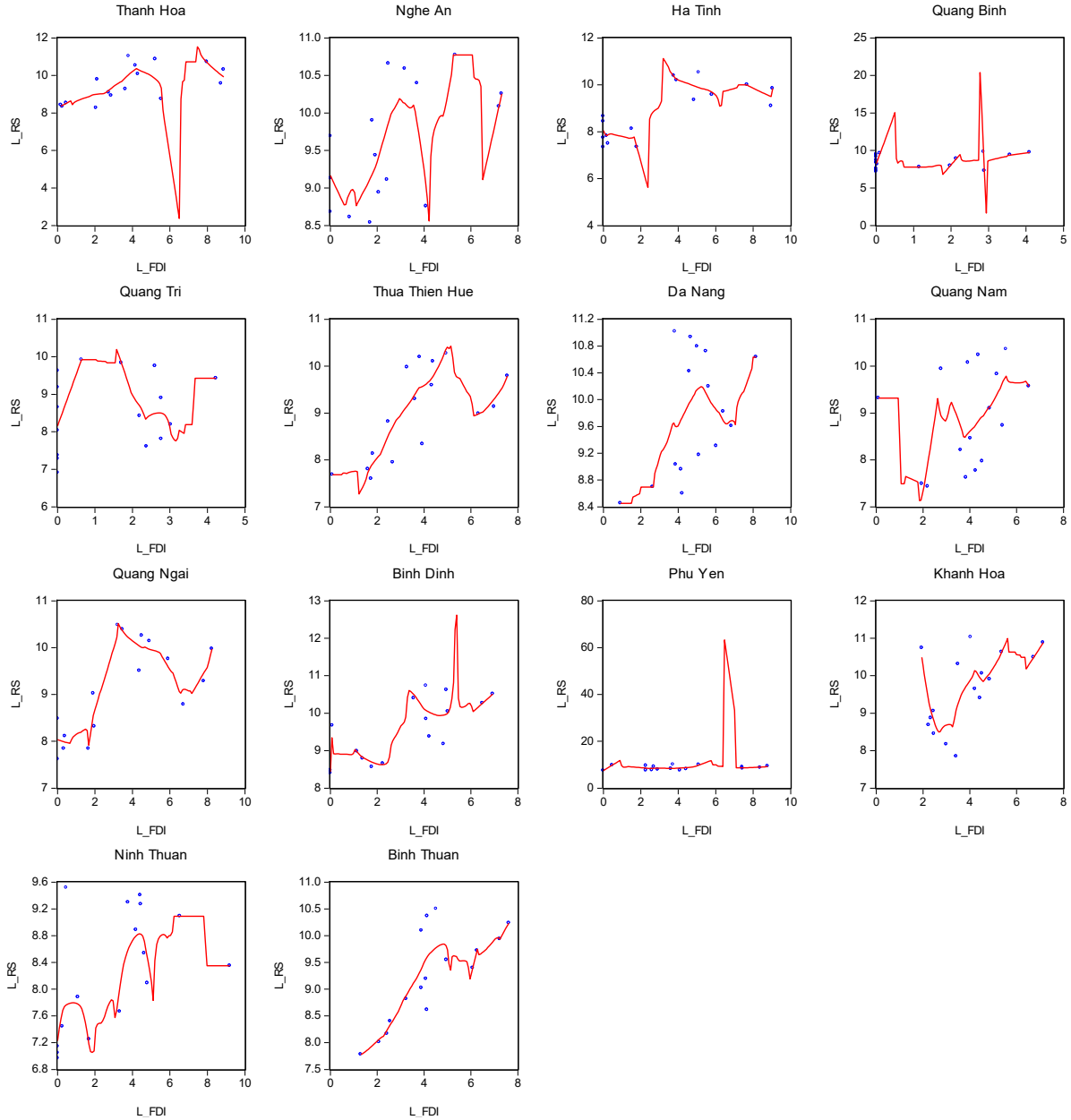
Note: L_RS and L_FDI indicate that RS and FDI are natural logarithm values.
Source: Author's calculations

Figure C.10 Scatterplots of FDI and RS at the Provincial Level in Region 1 in Vietnam



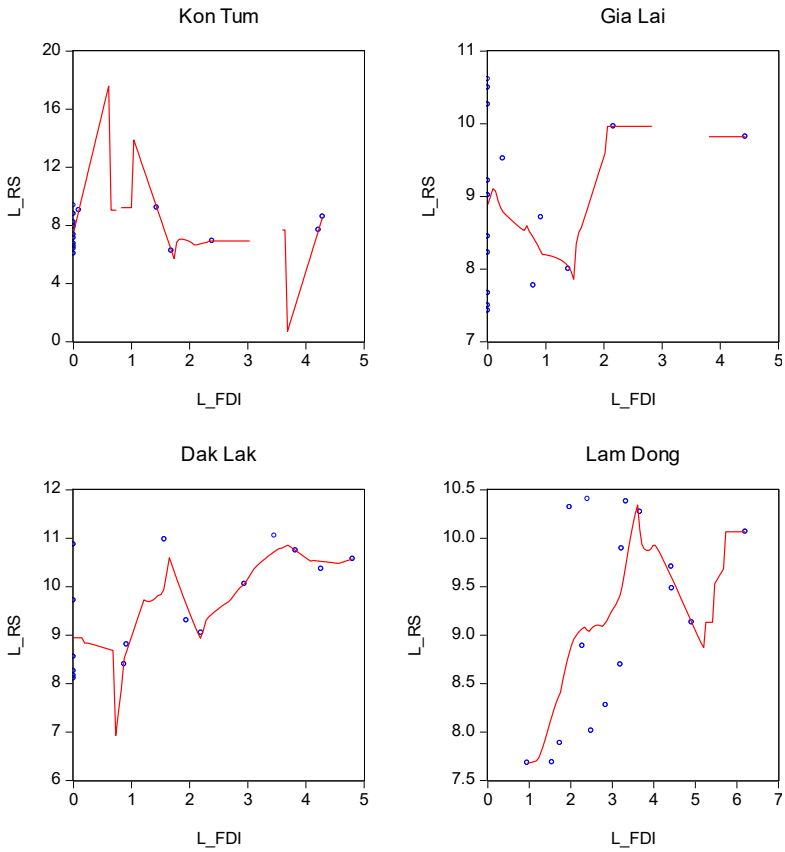
Notes: L_RS and L_FDI indicate that RS and FDI are natural logarithm values.
Sources: Author's calculations

Figure C.11 Scatterplots of FDI and RS at the Provincial Level in Region 2 in Vietnam



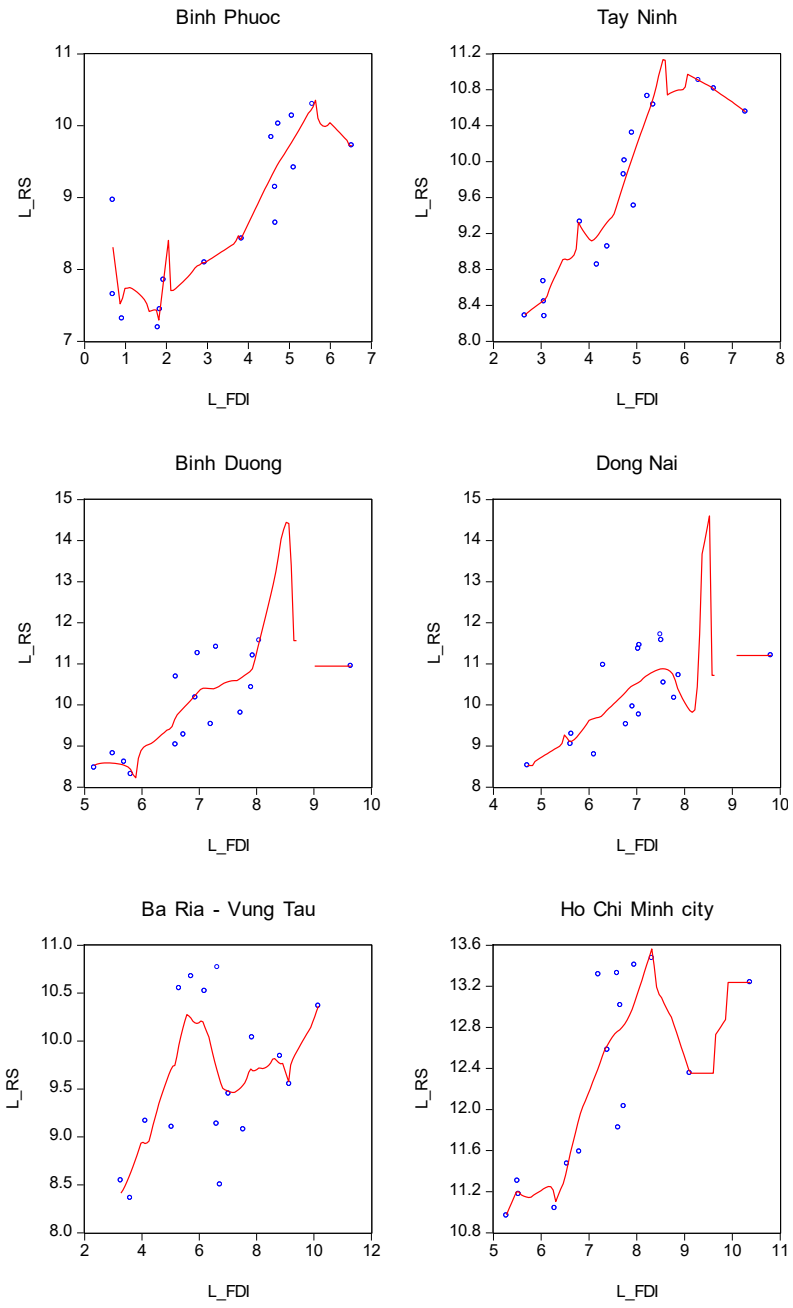
Notes: L_RS and L_FDI indicate that RS and FDI are natural logarithm values.
Sources: Author's calculations

Figure C.12 Scatterplots of FDI and RS at the Provincial Level in Region 3 in Vietnam



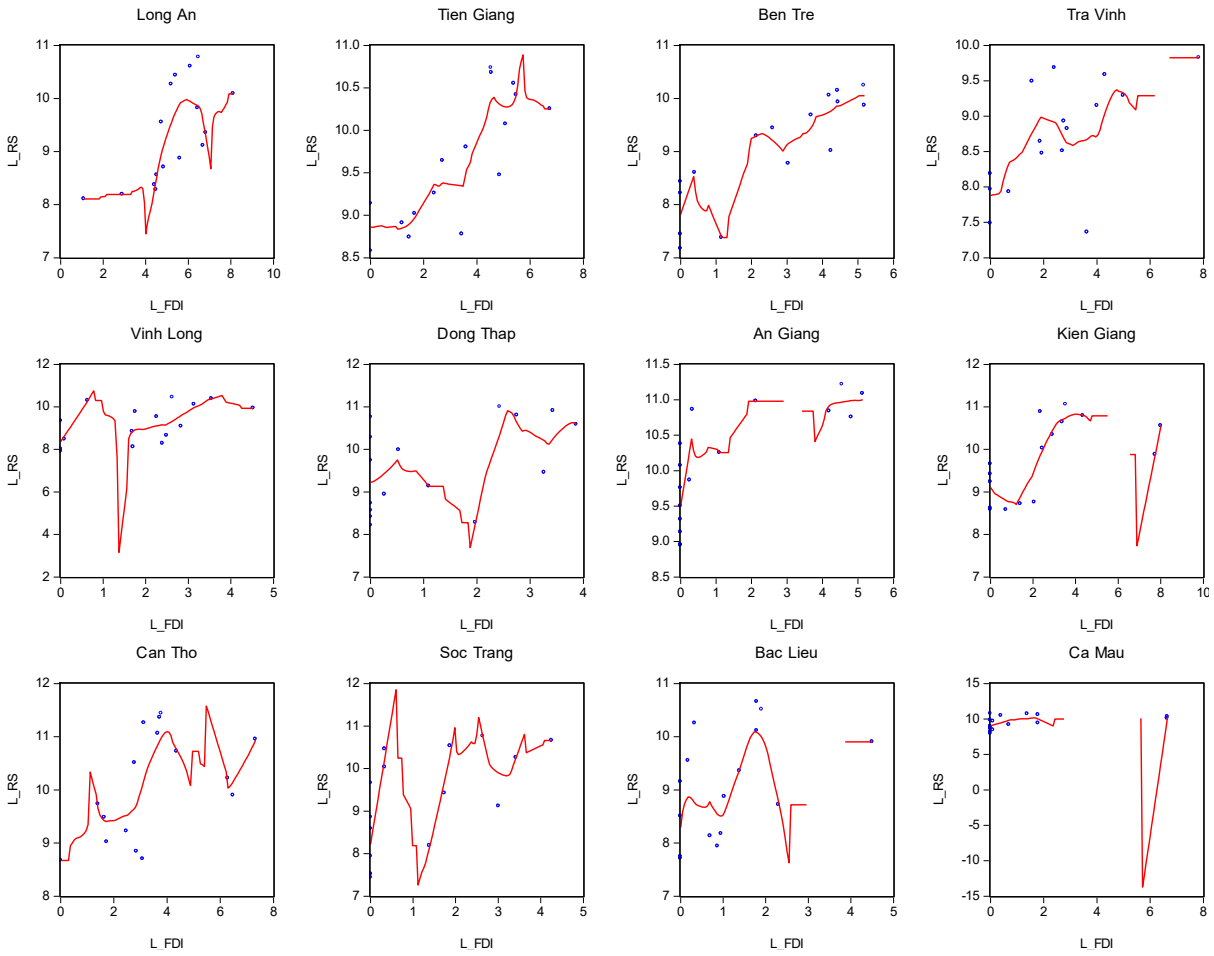
Notes: L_RS and L_FDI indicate that RS and FDI are natural logarithm values.
Sources: Author's calculations

Figure C.13 Scatterplots of FDI and RS at the Provincial Level in Region 4 in Vietnam



Notes: L_RS and L_FDI indicate that RS and FDI are natural logarithm values.
Sources: Author's calculations

Figure C.14 Scatterplots of FDI and RS at the Provincial Level in Region 5 in Vietnam



Notes: L_RS and L_FDI indicate that RS and FDI are natural logarithm values.
Sources: Author's calculations

Figure C.15 Scatterplots of FDI and RS at the Provincial Level in Region 6 in Vietnam

Table C.1 The Effects of FRE on the FDI Location Selection with PR2 at the Vietnam Provincial Level

PR2	**Without a time lag**		**With a time lag**	
	2000-2015 (Model 45)	2005-2015 (Model 50)	2000-2015 (Model 47)	2005-2015 (Model 52)
FDI change	1.3057-0.7630*PR2	1.8764-1.1294*PR2	1.2034-0.5413*PR2	1.5664-0.8583*PR2
PR2 = 0	1.3057	1.8764	1.2034	1.5664
PR2 = 1	0.5427	0.7470	0.6621	0.7081

Note: The values of 1.3057 and 1.8764 are the coefficients of FRE in Model 45 (see Table 5.44) and Model 50 (see Table 5.46), respectively. The values of 1.2034 and 1.5664 are the coefficients of FRE in Model 47 (see Table 5.45) and Model 52 (see Table 5.47), respectively. The values of -0.7630, -1.1294, -0.5413 and -0.8583 are the coefficients of interaction terms of FRE with PR2 in the models, respectively.
Source: Author's calculations

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